



StarFire™ RTK 869 MHz



OPERATOR'S MANUAL StarFire™ RTK 869 MHz OMPFP16555 ISSUE G6 (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.

Additional Proposition 65 Warnings can be found in this manual.

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



Introduction

Foreword

THANK YOU for purchasing a John Deere product.

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

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

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

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction the machine or implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Operator's Manual. Accurately record all the numbers to help in tracing the product should it be stolen.

Serial Number:

Your dealer also needs these numbers when you order parts. File a backup of the identification numbers in a safe location off the machine or away from the product.

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

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

If you are not the original owner of this product, it is in your interest to contact your local John Deere dealer to inform them of this unit's serial number. This will help John Deere notify you of any issues or product improvements.

JS56696,0000C4C -19-26JUN15-1/1

John Deere Technical Information Bookstore

NOTE: Product functionality may not be fully represented in this document due to product changes occurring after the time of printing. Read the latest Operator's Manual prior to operation. To obtain a copy, see your dealer or visit www.deere.com and use the 'Search for Agricultural Equipment Operator's Manuals' link to locate the John Deere Technical Information Bookstore.

CZ76372,000071F -19-20APR15-1/1

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

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Previous Editions
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Safety

Recognize Safety Information

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

Follow recommended precautions and safe operating practices.



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

TS1389 —UN—28JUN13

Understand Signal Words

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

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

 **DANGER**

 **WARNING**

 **CAUTION**

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.

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

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

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



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

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

TS201 —UN—15APR13

Practice Safe Maintenance

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

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

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

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

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

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



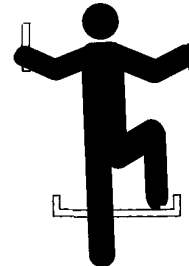
TS218 —UN—23AUG88

DX,SERV -19-17FEB89-1/1

Use Steps and Handholds Correctly

Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps, handholds, and handrails.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.



T133468 —UN—15APR13

DX,WWW,MOUNT -19-12OCT11-1/1

Handle Electronic Components and Brackets Safely

Falling while installing or removing electronic components mounted on equipment can cause serious injury. Use a ladder or platform to easily reach each mounting location. Use sturdy and secure footholds and handholds. Do not install or remove components in wet or icy conditions.

If installing or servicing a RTK base station on a tower or other tall structure, use a certified climber.

If installing or servicing a global positioning receiver mast used on an implement, use proper lifting techniques and wear proper protective equipment. The mast is heavy and can be awkward to handle. Two people are required when mounting locations are not accessible from the ground or from a service platform.



TS249 —UN—23AUG88

DX,WW,RECEIVER -19-24AUG10-1/1

Use Electronic Display Properly

Electronic displays are secondary devices intended to aid the operator in performing field operations, increase comfort and provide entertainment. Displays offer a wide range of functionality, are used in many different machine system applications and can be used with other secondary devices such as handheld electronic devices.

A secondary device is any device that is not required to operate your machine for its primary use. The operator is always responsible for safe operation and control of the machine.

To prevent injury while operating the machine:

- Position the display according to the installation instructions. Ensure that the device is secured and does not obstruct the driver's view or interfere with the machine operating controls.
- Do not become distracted by the display. Stay alert. Pay attention to the machine and surrounding environment.

- Do not change settings or access any functions that require prolonged use of the display controls while machine is moving. Stop the machine in a safe location and place in park position before attempting such operations.
- Never set the volume so high that you cannot hear outside traffic and emergency vehicles.

To promote safe operation, certain functions of displays may be disabled unless the machine movement is restricted and/or has been placed in the park position. Overriding this safety feature may violate applicable law and can result in damage, serious injury, or death.

Only use available display functionality when conditions permit you to do so safely and in accordance with instructions provided. Always observe safe driving rules, state, or local laws and traffic regulations when using any secondary device.

DX,ELEC,DISPLAY -19-13JAN15-1/1

Prevent Electrical Shock and Fires

Battery-powered equipment or other electric power sources produce an electrical shock, sparks, or arcs if a short circuit occurs. Electrical short circuits can reach temperatures high enough to burn people, or ignite or melt common materials.

To prevent injury from electrical shock, burns, or potential fire hazards, always disconnect battery power or other electric power source on equipment before installing or servicing:

- Remove ground (negative terminal [-]) battery clamp.
- Detach and remove battery.
- Switch off main battery or other electric power source.
- Unplug electric power source from equipment.

Understand and follow all local codes and regulations when installing electrical equipment.



PC12631—UN—04JUN10

HC94949,0000487 -19-27JAN14-1/1

Avoid Exposure to High Radio Frequency Fields

Prevent injury from exposure to high radio frequency fields at the antenna. Do not touch antenna while the system is transmitting. Always disconnect power to the antenna before installing or servicing.

The antenna should always be separated from the operator or nearby persons by a minimum distance of 20 cm (8 in.).



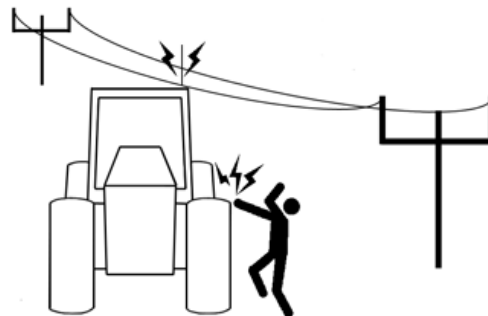
PC12632—UN—04JUN10

JS56696,0000C0E -19-11DEC12-1/1

Avoid Electrical Power Lines

Machine antenna may be high enough to come in contact with low-hanging electrical cables. Avoid severe electrical shock injury:

- Keep away from all low-hanging electrical cables while operating or transporting machine.



PC13658—UN—08NOV11

HC94949,0000488 -19-24JAN14-1/1

Avoid Buried Utility Lines

Digging through gas, electric, or water lines can cause serious injury or death to you or others. Contact local utility companies to determine and mark off location of gas, electric, or water lines before digging.



PC18243—UN—17DEC13

HC94949,0000462 -19-17DEC13-1/1

Waste Electrical and Electronic Equipment

Products marked with the crossed-out wheeled bin symbol indicate electrical and electronic equipment that must not be disposed of as unsorted municipal or household waste.

Send electrical and electronic equipment, accessories and packaging for environmental recycling.



PC17530 —UN—06AUG13

RM72004,00001E6 -19-05AUG13-1/1

Safety Labels

Text Label

A—Label, Warning



A

PC18291—UN—06JAN14

PC18408—19—24JAN14

HC94949,0000477 -19-24JAN14-1/1

Text-Free Labels

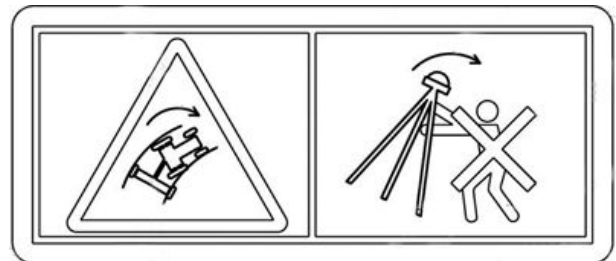
Label A—Warning

Movement of StarFire™ Receiver while connected to power source could cause unexpected machine movement resulting in serious injury or death.

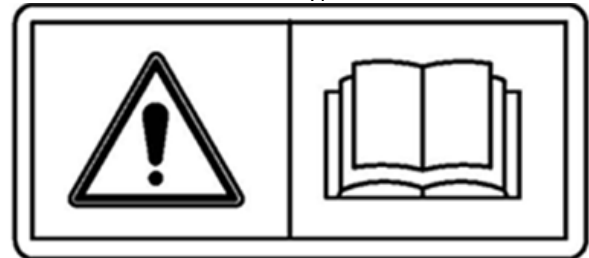
Label B—Warning

This Operator's Manual contains important information necessary for safe machine operation. Carefully observe all safety rules to avoid accidents.

A—Label, Receiver Movement B—Label, Operator's Manual



A



B

HC94949,0000478 -19-10JAN14-1/1

PC18296—UN—07JAN14

PC18259—UN—07JAN14

PC18317—UN—17JAN14

Regulatory and Compliance Information

Public Satellite Based Augmentation Systems (PSBAS)

Public Satellite Based Augmentation Systems (PSBAS) is a general term given to satellite signals available for use by the public. The type of PSBAS available depends upon the users geographical location in the world. For example: the PSBAS in North America is WAAS.

Region	PSBAS Name
North America	WAAS
Europe	EGNOS
Japan	MSAS

JS56696,0000511 -19-28JAN09-1/1

Country Use Restrictions

IMPORTANT: Contact your local radio authorities for country-specific regulations and licensing.

NOTE: Commission of European Post and Telecommunications (CEPT) regulates effectively radiated power output (ERP) from the radio at 27 dBm (500 mW). Usage of an antenna other than the one supplied might lead to violation of the free license regulation.

StarFire™ RTK 869 MHz radio is designed to operate on a specific range of frequencies. The exact use of frequencies differs from one region and (or) country to another. It is the operator's responsibility to ensure radio operates to all local regulations and licensing. Operating on some frequencies may require a specific license or permit.

StarFire™ RTK 869 MHz radio is designed to operate in the following countries listed on free license frequency band of 869.400 – 869.650 MHz (not incorporating the band 869.300 – 869.400 MHz) according to recommendation CEPT/ERC/REC 7003.

NOTE: Country codes follow ISO 3166-1 alpha-2 standard.

A licence is required in Ethiopia, Ghana, Kenya, Lithuania, Swaziland, and Zambia.

Countries

- Austria, AT
- Belgium, BE

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- Bulgaria, BG
- Croatia, HR
- Cyprus, CY
- Czech Republic, CZ
- Denmark, DK
- Estonia, EE
- Finland, FI
- France, FR
- Germany, DE
- Greece, GR
- Hungary, HU
- Iceland, IS
- Ireland, IE
- Italy, IT
- Latvia, LV
- Luxembourg, LU
- Malta, MT
- Netherlands, NL
- Nigeria, NG
- Norway, NO
- Poland, PL
- Portugal, PT
- Romania, RO
- Serbia, RS
- Slovakia, SK
- Slovenia, SI
- South Africa, ZA
- Spain, ES
- Sweden, SE
- Switzerland, CH
- Turkey, TR
- United Kingdom, GB

AL70325,0000392 -19-05JUL16-1/1

EC Declaration of Conformity

Deere & Company
Moline, Illinois U.S.A

The undersigned hereby declares that

Product Name: 869 MHz RTK, StarFire RTK, GTRS

Part Number(s): AZ102377, AZ200412, AZ200409

fulfills all relevant provisions and essential requirements of the following directives:

DIRECTIVE	NUMBER	CERTIFICATION METHOD
Radio and Telecommunications Terminal Equipment Directive (R&TTE)	1999/5/EC	Annex IV of the Directive
Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)	2011/65/EC	Article 7 of the Directive

The product is in conformity with the following standards and/or other normative documents:

ETSI EN 301 489-1 V1.9.2
 ETSI EN 301 489-3 V1.6.1
 ETSI EN 300 220-1 V2.4.1
 ETSI EN 300 220-2 V2.4.1
 IEC 60950-1: 2005 (2nd Edition)+A1:2009 and EN 60950-1:
 2006+A11:2009+A1:2010+AC:2011+A12: 2011
 E/ECE Regulation No. 10, Revision 4 (2012)
 1999/519/EC

Notified bodies involved:

CETECOM ICT Services
 Untertürkheimer Straße 6-10
 66117 Saarbruecken, Germany

Nemko Oy
 Perkkaantie 11
 FI-02600 Espoo, Finland

Name and address of the person in the European Community authorized to compile the technical construction file:

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Place of declaration: Urbandale, Iowa U.S.A.

Date of declaration: December 11, 2015

Name: Daniel L. Pflieger

Title: Development Manager Communications
 & Automation
 Manufacturing unit: John Deere Intelligent
 Solutions Group

DXCE01 —UN—28APR09



AL70325.0000381 -19-03FEB16-1/1

System Overview

Theory of Operation

StarFire™ RTK 869 MHz system delivers 2.5 cm (1 in) repeatable accuracy. This system consists of a local base station placed in a field or mounted on a structure that transmits high accuracy corrections to machine StarFire™ Receiver using real time kinematic (RTK) radios. The system requires machine and base station receivers to see a minimum of the same five satellites.

(Reference StarFire™ Receiver Operator's Manual for more information.)

NOTE: RTK signal interruptions occur if obstacles, such as hills, trees, or buildings, block free line of sight between RTK antennas.

RTK radio on machine must have a direct line of sight with a base station or a repeater to receive the RTK correction signals. Repeaters receive base station signals and

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establish a new line of sight by transmitting signal around obstacles. Repeaters do not extend operating distance of base station and should not be linked in a series. To ensure proper and stable network operation, only three repeaters per base station should be utilized.

Operating distance from base station affects RTK system performance. When operating beyond 20 km (12 mi), degraded accuracy occurs and it may take longer to acquire RTK signal.

StarFire™ RTK 869 MHz systems are not compatible with systems that operate outside of 869 MHz frequency range. The 869 MHz frequency is usable by various applications. It is not necessary to license the RTK radio through the government in approved countries. To avoid interference, watch for other 869 MHz radio applications in your area. John Deere RTK signals are encrypted and can only be decoded by a StarFire™ Receiver.

AL70325,0000382 -19-03FEB16-1/1

Components

⚠ CAUTION: To prevent injury and allow uninterrupted operation of base station (and repeater), installation must meet all applicable electrical standards and regulations. Components mounted far away from ground must be grounded and have lightning protection. Use a licensed electrician to ensure system installation is correct and compliant.

IMPORTANT: Install antenna and tighten antenna by hand before powering radio on. Do not overtighten antenna. Powering radio without an antenna may cause permanent damage.

NOTE: StarFire™ Receiver must be SF2 ready and have a real time kinematic (RTK) activation.

StarFire™ RTK 869 MHz system includes the following hardware components:

Base Station

- GreenStar™ Display is used to set up radio and can be removed.
- StarFire™ Receiver uses global positioning system (GPS) and correction satellites to calculate accurate base station position.
- StarFire™ RTK 869 MHz radio transmits correction signals to machine for accurate positioning.
- Radio antenna transmits signal for radio.
- Power source converts alternating current (AC) power to 12 V direct current (DC) power.

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GreenStar is a trademark of Deere & Company*

Repeater Station

- GreenStar™ Display or configuration and diagnostic tool is used to set up radio and can be removed.
- StarFire™ Receiver is used to set up radio and can be removed.
- StarFire™ RTK 869 MHz radio receives correction signals from base station and retransmits them to machines for accurate positioning.
- Radio antenna receives and transmits signal for radio.
- 12 V DC power source.

Machine

- GreenStar™ Display is used to set up radio.
- StarFire™ Receiver uses GPS and correction satellites to calculate accurate machine position.
- StarFire™ RTK 869 MHz radio receives correction signals from base station. Machine radio does not transmit signal.
- Radio antenna receives signal for radio.

Machine Repeater

- GreenStar™ Display is used to set up radio.
- StarFire™ Receiver is used to set up radio. Receiver uses GPS and correction satellites to calculate accurate machine position only for the machine it is installed on.
- StarFire™ RTK 869 MHz radio receives correction signals from base station and retransmits them to other machines for accurate positioning.
- Radio antenna receives and transmits signal for radio.

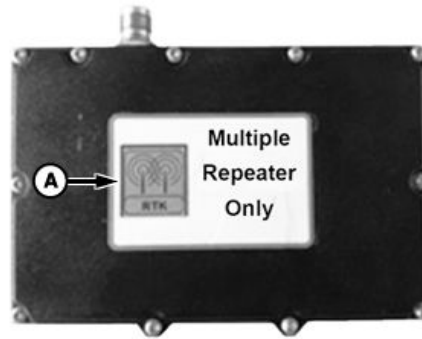
(Refer to component Installation Instructions, Operator's Manual, and (or) contact your John Deere dealer for more information on a specific component.)

RW00482,00003F2 -19-03MAR15-1/1

Multiple Repeater Decals



PC20047 —UN—02DEC14



PC20048 —UN—02DEC14

A—Decal

If StarFire™ RTK 869 MHz radio has a multiple repeater decal (A), it can only be used as a multiple repeater. Multiple repeaters are only configurable with the

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configuration and diagnostic tool and not with the display. Contact your John Deere dealer for support.

RW00482,00003FA -19-03MAR15-1/1

Configuring RTK Network

Configure Real Time Kinematic (RTK)

IMPORTANT: Anytime radio is configured or changed, cycle power at global positioning system (GPS) receiver before continuing.

1. Select Menu button > StarFire™ Receiver button > RTK softkey > Configure button.
2. Select Operating Mode from drop-down menu (A).
 - **Vehicle** – Use this mode for machine to receive signal corrections from base station or repeater.
 - **Vehicle Repeater** – Use this mode to allow machine to accept and repeat signal corrections.
 - **Repeater** – Use this mode to configure radio to act separately as repeater. A repeater is required if obstructions (trees, hills, or buildings) exist between base station and machine.
 - **Quick Survey Base** – Use this mode to test functionality without performing 24 hr. survey. Guidance lines are not repeatable and require shifting.
 - **Absolute Base** – Receiver must be mounted to a fixed position, like a building or post mounted in concrete. Absolute Base mode requires 24 hr. survey conducted on location before first use. After survey is completed, base station starts transmitting corrections. Since an absolute base station does not experience GPS drift, guidance lines are repeatable and do not require shifting.
 - **OFF** – Use this mode to disable all RTK functionality in receiver. RTK Operating Mode must be OFF for normal SF1 or SF2 operation.

NOTE: Base station and machine must be set up with same Time Slot (B), Network ID (C), and Radio Frequency (D). Network ID must be set between 4001 - 4090 to set up Shared Base Station (SBS) RTK Security.

3. Enter Time Slot and Network ID.
4. Select Radio Frequency from drop-down menu .
5. Select Accept button (E).

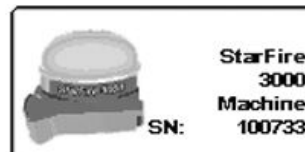
A—Operating Mode Drop-down Menu.
 B—Time Slot Entry Box
 C—Network ID Entry Box
 D—Radio Frequency Drop-down Menu
 E—Accept Button

PC8663 —UN—29APR15



Menu Button

PC13006 —UN—05NOV14



StarFire™ Receiver Button

PC18498 —UN—05NOV14



RTK Softkey

PC18499 —UN—05NOV14



Configure Button

Configure RTK Network

Operating Mode

Vehicle (A) ▾

Time Slot
1 - 10

1 (B)

Network ID
(1 - 4000)

4001 (C)

Radio Frequency (MHz)

1: 869.4125 (D) ▾

///

➡ (E)

Configure RTK Network

PC20156 —UN—05NOV14

RW00482,000040A -19-03MAR15-1/1

Verify Signal Level

Verify signal level (A) before setting up Quick Survey Base or Absolute Base.

Select Signal Level Help (B) for more details.

If Signal Level equals zero, no other transmitter is sending at this frequency.

If Signal Level is greater than zero, another transmitter is using the chosen frequency. Choose another frequency.

If a Repeater is already installed, Signal Level is greater than zero because the repeater is using the same frequency currently being investigated.

A—Signal Level

B—Signal Level Help Button

RTK Network Configuration		Base Station Data	
Configure		Status No Stored Base	
Operating Mode Quick Survey Base		Sat. Corrections 0	
Time Slot 1 - 10 1		Location Number No Stored Base	
Network ID (1 - 4000) 4001		Distance (ft) 0.00	
Radio Frequency (MHz) 1: 869.4125		Direction (°) 0	
		Base Battery (V) 11.8	

Radio Data	
Signal Level (A) → 0 ↻	(B) ?

PC20161—UN—05NOV14

RW00482,0000411 -19-03MAR15-1/1

Set Absolute Base Location

Once Absolute Base is configured, conduct a 24 hr. survey or manually enter base location information from previous survey. Select Edit stored RTK Base Start button (A).

A—Start Button

RTK Network Configuration		Base Station Data	
Configure		Status No Stored Base	
Operating Mode Absolute Base		Sat. Corrections 0	
Time Slot 1 - 10 1		Location Number No Stored Base	
Network ID (1 - 4000) 4001		Distance (ft) 0.00	
Radio Frequency (MHz) 1: 869.4125		Direction (°) 0	
		Base Battery (V) 11.8	

Radio Data	
Signal Level 0 ↻	(A) ? Edit stored RTK Base Start

PC20165—UN—05NOV14

Continued on next page

RW00482,000040B -19-03MAR15-1/3

Edit RTK Base Location – 24 hr. Survey

Select Survey RTK Base Location Start button (A). Read and follow steps in popup. Once survey is started, a 24 hr. countdown displays on RTK Configuration page. During the 24 hr. countdown the base station is non-functional and cannot be used. Do not switch power off. Once survey is complete, record and store base location survey results at a separate location for future reference.

Survey RTK Base Location

1. Select storage location (B).
2. Position StarFire™ Receiver.
3. Press start survey button (C).
4. Wait 24 hr. (display can be disconnected).
5. Base station location automatically saves at end of 24 hr. survey.

A—RTK Base Location Start Button
B—Storage Location Drop-down Menu
C—Start 24 hr. Survey Button

Edit RTK Base Location

Survey RTK Base Location

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RW00482,000040B -19-03MAR15-2/3

PC18508 —UN—26FEB14

PC18509 —UN—26FEB14

Edit RTK Base Location – Manual Entry

Ensure receiver is mounted in exact same position as previous survey. Enter previously recorded 24 hr. survey results.

1. Select Base Location from drop-down menu (A).
2. Enter Base Latitude (B).
3. Enter Base Longitude (C).
4. Enter Base Altitude (D).
5. Select Accept (E).

A—Base Location Drop-down Menu
B—Base Latitude
C—Base Longitude
D—Base Altitude
E—Accept Button

Edit RTK Base Location

RW00482,000040B -19-03MAR15-3/3

PC18507 —UN—26FEB14

Configuring Shared Base Station Security

Theory of Operation

Shared Base Station (SBS) Security adds restrictions so unwanted users cannot access real time kinematic (RTK) network. This security feature only allows authorized receivers to access RTK corrections from base station. Receiver serial numbers can be added and removed at any time with a GreenStar™ 2 Display or GreenStar™ 3 Display.

Compatibility

NOTE: StarFire™ Receiver software should be updated to latest version for best performance and compatibility.

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Base Station

SBS Security feature is not available on Original StarFire™ Receivers being used as base stations.

Machine Receiver

SBS Security feature is compatible with Original StarFire™ Receivers or newer.

RW00482,000040C -19-30JAN15-1/1

Set Up Shared Base Station Security

PC20169 —UN—05NOV14

Select Shared Base Station (SBS) Security softkey.

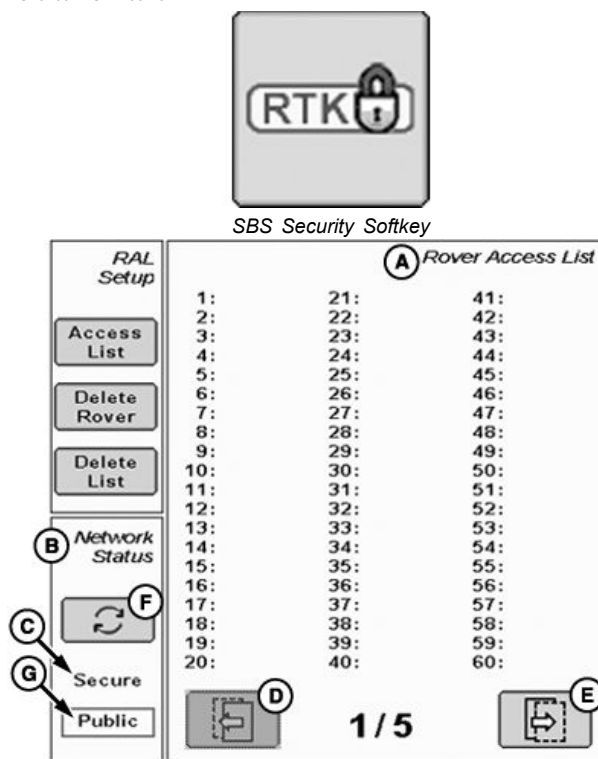
Only machine receiver serial numbers on Rover Access List (RAL) (A) can access real time kinematic (RTK) corrections from base station when Network Status (B) is in Secure mode (C). Record and store RAL at a separate location for future reference. RAL holds up to 300 serial numbers. Select page buttons (D and E) to navigate through RAL.

Select Network Status toggle (F) to switch between Secure and Public (G) modes.

- Public – This mode does not restrict machines from receiving RTK corrections as long as they have the same Network ID and Frequency as base station.
- Secure – This mode only allows a machine to receive RTK corrections if the serial number is entered in RAL.

A—Rover Access List
B—Network Status
C—Secure
D—Previous Page

E—Next Page
F—Network Status Toggle
G—Public



PC20170 —UN—05NOV14

Continued on next page

RW00482,000040D -19-03MAR15-1/5

Rover Access List

PC20180 —UN—04NOV14

1. Select Access List button.
2. Enter rover number (A).
3. Select Accept (B).

A—Rover Number Entry Box B—Accept Button

Edit Rover Access List — Page 1

RW00482,000040D -19-03MAR15-2/5

PC20178 —UN—04NOV14

NOTE: To view receiver six-digit serial number, select Menu > StarFire™ softkey > Activations tab.

4. Enter machine receiver serial number (A).
 5. Select Accept (B) to place machine receiver on RAL.
- If serial number already exists in RAL, Serial Number Already Exists popup is displayed.

A—Serial Number Entry Box B—Accept Button

Edit Rover Access List — Page 2

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Continued on next page

RW00482,000040D -19-03MAR15-3/5

PC20179 —UN—29JAN15

Delete Rover

PC20181 —UN—04NOV14

1. Select Delete Rover button.
2. Enter rover number (A) to be deleted from RAL.
3. Select Delete button (B).

NOTE: Once a machine receiver serial number has been deleted from RAL, it takes approximately 18 min. before machine stops operating off that base station. During this time, machine transitions into RTK extend.

NOTE: Verify rover has been deleted by viewing RAL.

A—Rover Number Entry Box B—Delete button

Delete Rover

Enter rover number
to be deleted from the list

Rover # (1-300) A

//
Delete B

Delete Rover

RW00482,000040D -19-03MAR15-4/5

PC20184 —UN—04NOV14

Delete All Entries

PC20182 —UN—04NOV14

1. Select Delete List button.
2. Select Yes (A) to delete all receivers from RAL. Select No (B) to return to SBS Security page without deleting all receivers from RAL.

A—Yes B—No

Delete List

Delete Rover Access List

Are you sure you want to
delete the entire Rover Access List?

No B
Yes A

Delete Rover Access List

RW00482,000040D -19-03MAR15-5/5

PC20185 —UN—04NOV14

Machine Shared Base Station (SBS) Security Status

Machines on a secured network have one of the following real time kinematic (RTK) authorization states:

Unknown – Machine StarFire™ Receiver powers up in an unknown RTK authorization state. It exists in this state until communication with base station is established.

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Authorized – RTK page displays satellite corrections greater than 0 when authorized.

Not Authorized – Machine receiver serial number is not on RAL. If an unauthorized machine receiver tries to access a secured network, an alarm triggers on display.

RW00482,000040E -19-10NOV14-1/1

Troubleshooting

Shading and Multipathing

Shading and multipathing are responsible for most problems with the base station.

Shading occurs when objects are more than 5 degrees above the horizon and block the receiver's direct line of sight of a satellite. If an object can cast a natural shadow over the receiver, it can also cause shading.

Multipathing occurs when satellite signals are reflected off of objects and cause signal travel time to increase. Reflected signals take longer to reach base station receiver than direct signals and cause inaccurate satellite range measurements. Reflections can even interfere with the direct signal enough that the receiver temporarily

loses the satellite. Metal buildings, chain-link fences, and bodies of water are all good reflectors that can make a base station less reliable.

If a base station experiences either of these problems, it could be detrimental to your entire real time kinematic (RTK) system and operation. Ensure base station receiver:

- Is mounted to a rigid structure that does not move or sway.
- Has a good view of the sky, more than 5 degrees above the horizon.
- Has few to no reflective objects close to it.

(For more information, refer to base station Technical Manual, User Guide, or contact your John Deere dealer.)

RW00482,0000437 -19-02DEC14-1/1

Verify RTK Radio Network

Select Menu button > StarFire™ Receiver button > RTK softkey.

Verify RTK Network Configuration (A)

All real time kinematic (RTK) radios in network must match base station Time Slot (B), Network ID (C), and Frequency (D). If a vehicle or repeater in network does not match base station configuration, configure them to match.

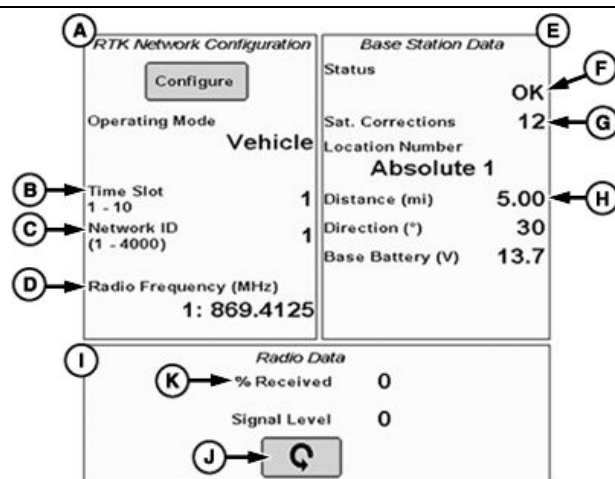
Verify Base Station Data (E)

Ensure Base Station Data field shows Status (F) as OK, Satellite Corrections (G) more than 7, and Distance (H) to base station location is less than 20 km (12 mi.).

Verify Radio Data (I)

Select Radio Data Refresh button (J) and observe % Received (K) for at least 15 minutes. The % Received increases 10% every 4 seconds until value is stable. If % Received is constantly between 80% and 100%, the position is good. If % Received is below 80%:

- Check for other 869 MHz radio applications in area, and change RTK Network Configuration (Frequency, Network ID, and Time Slot) on all network RTK radios to avoid interference.
- If available, select different base station or repeater as signal. Vehicle RTK Network Configuration must match RTK Network Configuration of signal source.



- A—RTK Network Configuration
B—Time Slot
C—Network ID
D—Frequency
E—Base Station Data
F—Status
G—Satellite Corrections
H—Frequency
I—Radio Data
J—Radio Data Refresh Button
K—% Received

- Select different base station and (or) repeater location. Do not exceed a maximum distance of 20 km (12 mi.) between radios (base station to repeater, repeater to machine, or base station to machine).

RW00482,0000459 -19-03MAR15-1/1

Additional Diagnostics Information

Signal Level

Signal (noise) level is strength of correction signal received from the base station or repeater. If setting up a base station and a repeater hasn't been installed, a signal level greater than zero means there is an interfering transmitter using the same frequency.

Signal level decreases when distance to reference station increases. John Deere recommends setting up more base stations instead of extending the signal with repeater chains. Even with repeaters, the absolute maximum range from base station should not exceed 20 km (12 mi). Once the range is exceeded, correction signal decreases from real time kinematic (RTK) to SF2.

To get an RTK signal, it is mandatory to have a minimum signal level of 20%. Below this level, the correction data cannot be received completely. Use a signal level higher than 60% to operate with RTK signal.

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Data Received

Base station transmits one data package (correction signal) every four seconds. If machine receives data every four sec., % Received shows 100%. If one or more packages cannot be received, the value drops.

Corrections Age

The corrections age shown in the satellite page gives information about the age of the last received correction data package. Since the base station transmits one package every four seconds, the corrections age normally counts from one to four and then starts again at one. If packages are not received at rover site, the correction age increases to eight (one package missing) or twelve (two packages missing). If more than two packages are not received, the rover receiver changes to RTK Extend™ mode until corrections are available again.

RW00482,0000477 -19-03MAR15-1/1

Base Station Quality Indicator (BSQI)

BSQI indicates the average drift in centimeters of the base station position over the previous 24 hours. BSQI requires 25 hr. of continuous power to ensure base station has good positioning, 1 hr. for pull-in plus 24 hr. base station

operation. Diagnostic address values do not correlate with field accuracy. Values indicate if the base station receiver is experiencing shading, multipathing, or movement. If a value exceeds a threshold limit, a diagnostic trouble code (DTC) is displayed.

Diagnostic Address	Description	Good Positioning Value	Bad Positioning Value
140	24 hr. survey position standard deviation, east (in. or cm)	<5	>5
141	24 hr. survey position standard deviation, north (in. or cm)	<5	>5
142	24 hr. survey position standard deviation, up (in. or cm)	<10	>10

RW00482,000045A -19-03MAR15-1/1

SF2 Fallback

IMPORTANT: Do not enable SF2 fallback in situations where RTK accuracy is critical. Accuracy while operating in SF2 mode is not equal to performance of RTK.

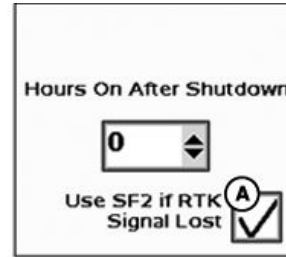
Select Menu button > StarFire™ button > StarFire™ softkey > Setup tab.

SF2 fallback defaults to off. Enable SF2 fallback by selecting checkbox (A).

Enabling SF2 fallback allows real time kinematic (RTK) users to transition directly to SF2 after RTK signal corrections are lost and RTK Extend™ (RTK-X) times out. StarFire™ signal must be present when RTK-X times out.

SF2 fallback can be used for up to 14 days after RTK corrections are lost. The receiver then defaults to WAAS or EGNOS if available. After 14 days, a connection to RTK is required to continue use of this feature. When returning to RTK corrections, a guidance line jump may be experienced.

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RTK Extend is a trademark of Deere & Company*



**A—Use SF2 if RTK Signal Lost
Checkbox**

In order to have SF2 fallback available at machine, base station receiver must complete acquisition of StarFire™ signal (average 45 min.). When RTK corrections are lost at machine, RTK-X lasts for 15 min. before SF2 fallback is utilized.

Readings Tab

To view RTK readings:

1. Select Diagnostics softkey.
2. Select Reading tab (A).
3. Select information from drop-down menu (B).

Hardware and Software

- Software Part Number
- Software Version Number
- Hardware Part Number
- Hardware Serial Number

System Voltages

- Unswitched Voltage
- Switched Voltage
- CAN High Voltage
- CAN Low Voltage

Receiver Status

- Receiver Hours
- Receiver Address
- QuickStart Status
- External Antenna
- Serial NMEA

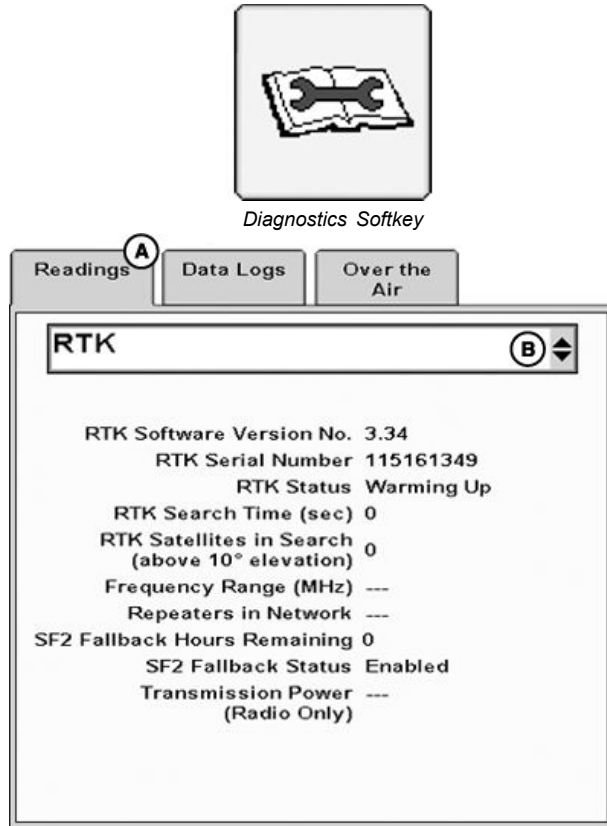
The following readings only appear when receiver has a real time kinematic (RTK) activation.

RTK

- RTK Software Version Number
- RTK Serial Number
- RTK Status
- RTK Search Time (sec.)
- RTK Satellites in Search (above 10° elevation)
- Frequency Range (MHz)
- Repeaters in Network
- SF2 Fallback Hours Remaining
- SF2 Fallback Status

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PC18516 —UN—26FEB14



A—Readings Tab

B—Readings Drop-down Menu

- Transmission Power (Radio Only)

SF2 Fallback

- SF2 Fallback Status
- SF2 Fallback Days Remaining
- StarFire™ Offset Status
- StarFire™ Signal
- Last SF2 Fallback Failure Mode
- Time of Last Failure

PC20193 —UN—05NOV14

RW00482,0000412 -19-03MAR15-1/1

Frequently Asked Questions

StarFire™ RTK 869 MHz Radio Network Planning and Setup

1. Can I use doubled frequencies in an RTK network?
StarFire™ RTK 869 MHz Radio uses the 869 MHz frequency band and is limited to 10 frequencies. Plan real time kinematic (RTK) networks so frequencies used cannot interfere with each other, either on the ground or in the air. Use each frequency only once per network. Consider the setup of bordering networks.
2. Do I need more base stations or repeaters in case I cannot receive RTK corrections in the field?
Signal reception radius from a base station or repeater is shorter on the ground than up in the air. You may not receive any RTK corrections from a certain antenna location in the field, but other repeaters might receive RTK correction signals from that antenna. This leads to signal interferences and RTK dropouts in the respective and bordering networks.
3. Why is line of sight so important to operate a proper RTK network?
It is important to obtain line of sight between antennas (base station, repeater, and machine) to ensure a proper communication within an RTK network. Base Station and Repeaters outside the line of sight increases the broadcasted area for a frequency. This leads to interferences with other antenna locations and networks. To ensure a proper and stable network operation only three repeaters per base station should be utilized. This helps avoid doubled frequencies and interferences, and results in an optimized setup of networks.

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4. What is the purpose of a repeater?
Repeaters can broadcast the RTK correction signal around obstacles (for example, woods, hills, or buildings). Using repeaters to increase the range of a network may result in interferences with other antennas and (or) other networks. Do not link repeaters in a series to extend operating distance.
5. Can I use high gain antennas?
Only use high gain antennas to compensate for cable losses. Do not use high gain antennas to expand the antenna or network range. It is mandatory in any case that the radio output power does not exceed 0.5 W in total.
6. What happens if an RTK Network does not fulfill these guidelines?
Existing networks with no interferences or RTK dropouts do not require changes. RTK networks must comply with the respective country and telecommunications regulations.
7. Who can I ask for help?
In order to achieve an optimum RTK network setup, involve your John Deere dealer at the beginning of the RTK network-planning phase, throughout the setup, and expansion phase.
8. What can I do in case an RTK network has gaps?
If topographic and environmental influences create gaps, a John Deere Mobile RTK Modem may be used to close the respective gaps.

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John Deere Service Literature Available

Technical Information

Technical information can be purchased from John Deere. Publications are available in print or CD-ROM format.

Orders can be made using one of the following:

- John Deere Technical Information Store:
www.JohnDeere.com/TechInfoStore
- Call 1-800-522-7448
- Contact your John Deere dealer

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.
- **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 a separate component technical manual.
- **EDUCATIONAL CURRICULUM** including five comprehensive series of books detailing basic information regardless of manufacturer:
 - Agricultural Primer series covers technology in farming and ranching.
 - Farm Business Management series examines "real-world" problems and offers practical solutions in the areas of marketing, financing, equipment selection, and compliance.
 - Fundamentals of Services manuals show you how to repair and maintain off-road equipment.
 - Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.
 - Fundamentals of Compact Equipment manuals provide instruction in servicing and maintaining equipment up to 40 PTO horsepower.



TS189 —UN—17JAN89



TS191 —UN—02DEC88



TS224 —UN—17JAN89



TS1663 —UN—10OCT87

DX,SERV LIT -19-21APR16-1/1

John Deere Service Keeps You On The Job

John Deere Is At Your Service

CUSTOMER SATISFACTION is important to John Deere.

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

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



TS201 —UN—15APR13

CUSTOMER SATISFACTION PROBLEM RESOLUTION PROCESS

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

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

- Machine model and product identification number
- Date of purchase
- Nature of problem

2. Discuss problem with dealer service manager.

3. If unable to resolve, explain problem to dealership manager and request assistance.

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

DX,IBC,2 -19-02APR02-1/1

