

# MATRIX<sup>®</sup> PRO

USER MANUAL

MATRIX<sup>®</sup> PRO840G



MATRIX<sup>®</sup> PRO570G

**TeeJet<sup>®</sup>**  
TECHNOLOGIES

A Subsidiary of  Spraying Systems Co.<sup>®</sup>

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**Safety Information**

TeeJet Technologies is not responsible for damage or physical harm caused by failure to adhere to the following safety requirements.

As the operator of the vehicle, you are responsible for its safe operation.

The Matrix Pro in combination with any assisted/auto steering device is not designed to replace the vehicle’s operator.

Do not leave a vehicle while the Matrix Pro is engaged.

Be sure that the area around the vehicle is clear of people and obstacles before and during engagement.

The Matrix Pro is designed to support and improve efficiency while working in the field. The driver has full responsibility for the quality and work related results.

Disengage or remove any assisted/auto steering device before operating on public roads.

## CHAPTER 1 - SYSTEM OVERVIEW

The Matrix Pro allows the management of multiple connected modules plus GPS mapping, Guidance, Assisted/Auto Steering, BoomPilot®, and data collection in a single console using CAN bus technology. This replaces multiple consoles in the cab with one robust system.

### SYSTEM FEATURES

- RealView™ Guidance Over Video Guidance information and video displayed simultaneously with up to eight (8) cameras connections
- Easy-to-use, color 3-D graphical guidance that is precise and accurate in all terrain
- Lightbar guidance for vehicle or swath, plus a graphical display for complete guidance information
- Coverage mapping/data export in PDF, KML or SHP
- Enhanced data organization with Fieldware® Link application – Input job details such as names or images
- Reuse guidelines and/or boundaries
- Bright, daylight readable screen in either 5.7" / 14.5 cm or 8.4" / 21.3 cm size
- Product upgrades include:
  - FieldPilot® (auto steering) can perform on straight or contour paths
  - UniPilot® (assisted steering) can perform on straight or contour paths
  - BoomPilot® (automated boom section control) can switch off sprayer or spreader sections automatically reducing overlaps and eliminating skips
  - Tilt Gyro Module
  - Video Selection Modules for up to 8 cameras
  - External GPS receiver or antenna upgrades
- Handles up to 15 individual boom sections with a separate entry for guidance width
- Guidance in five modes – Straight AB, Curved AB, Circle Pivot, NextRow and Last Pass
- Additional guidance with Azimuth Degree guidance and Curved Lookahead guidance
- Exterior boundary and up to five (5) interior boundaries
- Save up to 25 guidelines in a single job
- Create multiple jobs and access them easily with Field Finder
- On screen tools – Calculator and Units Converter
- More than 20 localized languages for international use
- Simplified operation of product control and GPS record keeping
- High-quality internal GPS engine with small external antenna

## SYSTEM COMPONENTS

### Matrix Pro 570G Console

The Matrix Pro 570G is designed to provide years of service under typical agricultural operating conditions. A tight fitting enclosure, combined with rubber covers for all connectors mean that typical dusty environments will not cause operational problems. While occasional splashing of water will not damage the unit, the Matrix Pro 570G is not designed for direct exposure to rain. Take care not to operate the Matrix Pro in wet conditions.

Figure 1-1: Matrix Pro 570G Console Front and Back



### Additional Information

All changes are saved automatically.

The console needs to be cycled off and back on when changing or attaching equipment to the Matrix Pro system.

Cleaning suggestions – Matrix consoles should be cleaned with mild cleaners, such as glass cleaner, and a soft cloth. Take care not to rub dust or other abrasive materials into the touch screen surface.

- Use a soft lint-free cloth.
- The cloth may be used dry, or lightly dampened with a mild cleaner or Ethanol.
- Be sure the cloth is only lightly dampened, not wet. Never apply cleaner directly to touch panel surface; if cleaner is spilled onto touch panel, soak it up immediately with absorbent cloth.

- Cleaner must be neither acid nor alkali (neutral pH).
- Wipe the surface gently; if there is a directional surface texture, wipe in the same direction as the texture.
- Never use acidic or alkaline cleaners, or organic chemicals such as: paint thinner, acetone, toluene, xylene, propyl or isopropyl alcohol, or kerosene.
- Suitable cleaning products are commercially available pre-packaged for use; one example of such a product is Klear Screen™, or commercially available off-the-shelf retail brands such as Glass Plus® Glass and Surface Cleaner made by Reckitt-Benckiser.
- Use of incorrect cleaners can result in optical impairment of touch panel and/or damage to functionality.

## Matrix Pro 840G Console

The Matrix Pro 840G is designed to provide years of service under typical agricultural operating conditions. A tight fitting enclosure, combined with rubber covers for all connectors mean that typical dusty environments will not cause operational problems. While occasional splashing of water will not damage the unit, the Matrix Pro 840G is not designed for direct exposure to rain. Take care not to operate the Matrix Pro in wet conditions.

Figure 1-2: Matrix Pro 840G Console Front and Back



## RealView Camera

The TeeJet Technologies RealView camera allows video images to be displayed on the Matrix Pro screen. The camera can be pointed forward to enable RealView guidance over video, or it can be positioned to view other operational aspects of your equipment. The camera is equipped with a flexible RAM mount, integral sun shade and provides infrared illumination, allowing clear video images even in dark conditions.

Figure 1-3: RealView Camera



Matrix Pro console connection is compatible with AgCam cameras.

## Optional Accessories

### Fieldware Link

Catalog clients, farms, fields and jobs with Fieldware Link to take full advantage of the Matrix Pro console. Duplicate and edit jobs for reuse of boundaries and guidelines. Download this Matrix Pro software for free at [www.teejet.com](http://www.teejet.com).



### Video Selector Modules

A Video Selector Module (VSM) allows connection of up to 8 video cameras to your Matrix console. The module is compact and robust, and can be mounted in any convenient location. No interaction is required after installation.



### Steering Control Module

The Steering Control Module performs assisted/auto steering on straight and contour paths. The Matrix Pro system can link with the FieldPilot or UniPilot system to take precise control of the vehicle position. The operator manages the assisted/automatic steering system with the Matrix Pro – a benefit of a single, in-cab console.



### FieldPilot

FieldPilot automatic steering drives a vehicle with tremendous, repeatable accuracy in both straight and curved patterns by tapping directly into the vehicle's hydraulic steering system. The ability to operate in fog or dust, day or night with high levels of accuracy means a better return on capital investment for equipment, a more effective application and more attentive, alert operation.

### UniPilot

UniPilot assisted steering drives a vehicle with tremendous, repeatable accuracy in both straight and curved patterns by controlling the steering wheel. The ability to operate in fog or dust, day or night with high levels of accuracy means a better return on capital investment for equipment, a more effective application and more attentive, alert operation.



### Articulated Gyro Module

Combined with the Steering Control Module, the Articulated Gyro Module makes assiste/auto steering on an articulated tractor even better.



### Foot Switch

TeeJet Foot Switch is a convenient method of engaging assisted/auto steering. It is connected to the system via the SCM Harness.



## Section Driver Module

Combined with software built into the Matrix Pro console, the Section Driver Module (SDM) makes BoomPilot (automatic boom section control) possible. The SDM should be combined with the appropriate cable to interface with your BoomPilot system, spray controller and/or spraying machine for quick and easy installation. Section Driver Modules and their related cables are designed to control as many boom sections as the spray controller to which they are connected, up to a maximum of 15 boom sections.



## GPS Antennas

TeeJet offers a full range of high-quality GPS receivers to fit your precision farming needs.

RXA-30 GPS antenna provides a higher quality GPS receiver that can improve GPS performance in areas of sub-optimal GPS reception.

The Patch Antenna provides strong performance in standard operating conditions. The small size of the patch antenna makes it easy to mount and unlikely to be damaged.

Figure 1-4: GPS RXA-30 Antenna



Figure 1-5: GPS Patch Antenna II



## Tilt Gyro Module

If your GPS antenna is mounted 12 feet / 3.6 meters above the ground, a 10% side slope can cause 2 feet / 0.6 meter of position error. The TeeJet Tilt Gyro (Compensation) Module corrects GPS position errors caused by side slope conditions. Mounted on a solid structure on your vehicle, the Tilt Gyro (Compensation) Module sends tilt corrections to complement GPS signals from your receiver and provide corrected position data to your guidance device.



- Diagnostic LEDs indicate status of TGM
- Weatherproof electrical connector for trouble-free operation
- Mounting holes built into housing
- Compatible with Matrix guidance systems

*NOTE: If using FieldPilot or UniPilot, a TGM is already built into the system.*

## Harnesses

TeeJet Technologies harnesses are designed for reliable operation in harsh environments. Shielding and weatherproof connections ensure that the cables and electrical connections are reliable and trouble free.



## Cable Extensions

Cable extensions, or extended length cables, are available for special applications. Contact your TeeJet dealer for details if the standard cables provided with your system are not long enough.

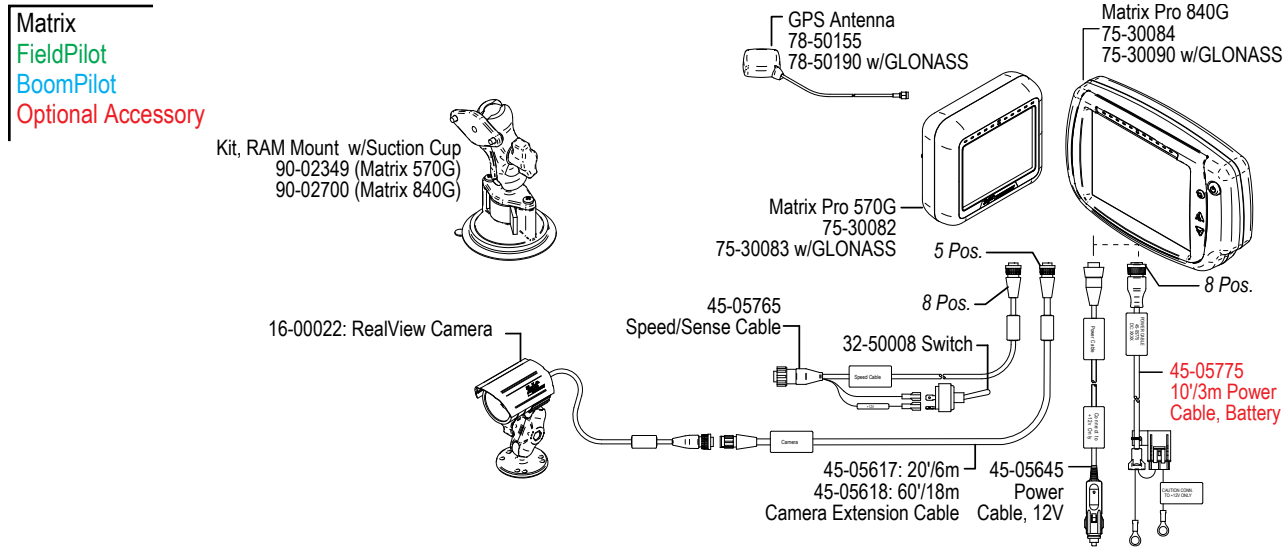
## Extended Warranty

TeeJet Technologies offers an extended warranty for many guidance products. However, this service is not available in all markets. Please contact your local TeeJet Technologies dealer for details.

## CONFIGURATIONS

The following diagrams are reflective of typical Matrix Pro configurations. Due to the variety of possible configurations, these should be used for reference purposes only.

Figure 1-6: Matrix Pro w/RealView Camera



### Speed Out / Sense In Cable

The Speed Out / Sense In Cable assists the Matrix Pro with two additional connections that:

- ▶ Send a radar speed signal to an external device
- ▶ Allow the user to operate the area applied function of the Matrix Pro in series with a remote master connection or existing apply on/off toggle in a single swath manner. However, if the previous connections are not available, the supplied toggle switch will allow area applied functionality without the need to connect to a functional application implement.

Connecting to different consoles requires different adapters and calibrations.

- If connecting to TeeJet consoles, please use speed adapter 45-20042
  - ◀ enter calibration # 914 (#1000 in Europe) for 8xx series in RAD mode
  - ◀ enter calibration # 9140 (#10000 in Europe) for below LH 70 Series, LH 85, 500 series, 5000, 6000, IC 18, IC 24 and IC 34
- If connecting to Mid-Tech consoles no adapter is required
  - ◀ enter calibration # 1000
- If connecting to Raven consoles use speed adapter 45-05508 (do not connect the 12v red wire from 45-05508)
  - ◀ enter calibration # 800

### Speed Out / Sense In Cable Is Required To Start Application Mapping.

The Speed Out / Sense In Cable allows the user to operate the area applied function of the Matrix Pro in series with a remote master connection or existing apply on/off toggle in a single swath manner. However, if the previous connections are not available, the supplied toggle switch will allow area applied functionality without the need to connect to a functional application implement.

The cable also sends a radar speed signal to an external device.

To install your cable:

- Connect using included switch (32-50008)
- OR
- Connect green wire to master 12 Volts on/off from rate controller, foot switch or implement status switch

If sensing boom shut-off for applied mapping from an existing console, attach the green wire to the valve side of the master switch on the console. The red wire is not used.

Figure 1-7: Speed Out / Sense In cable

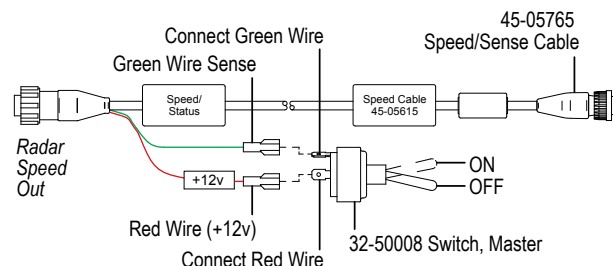
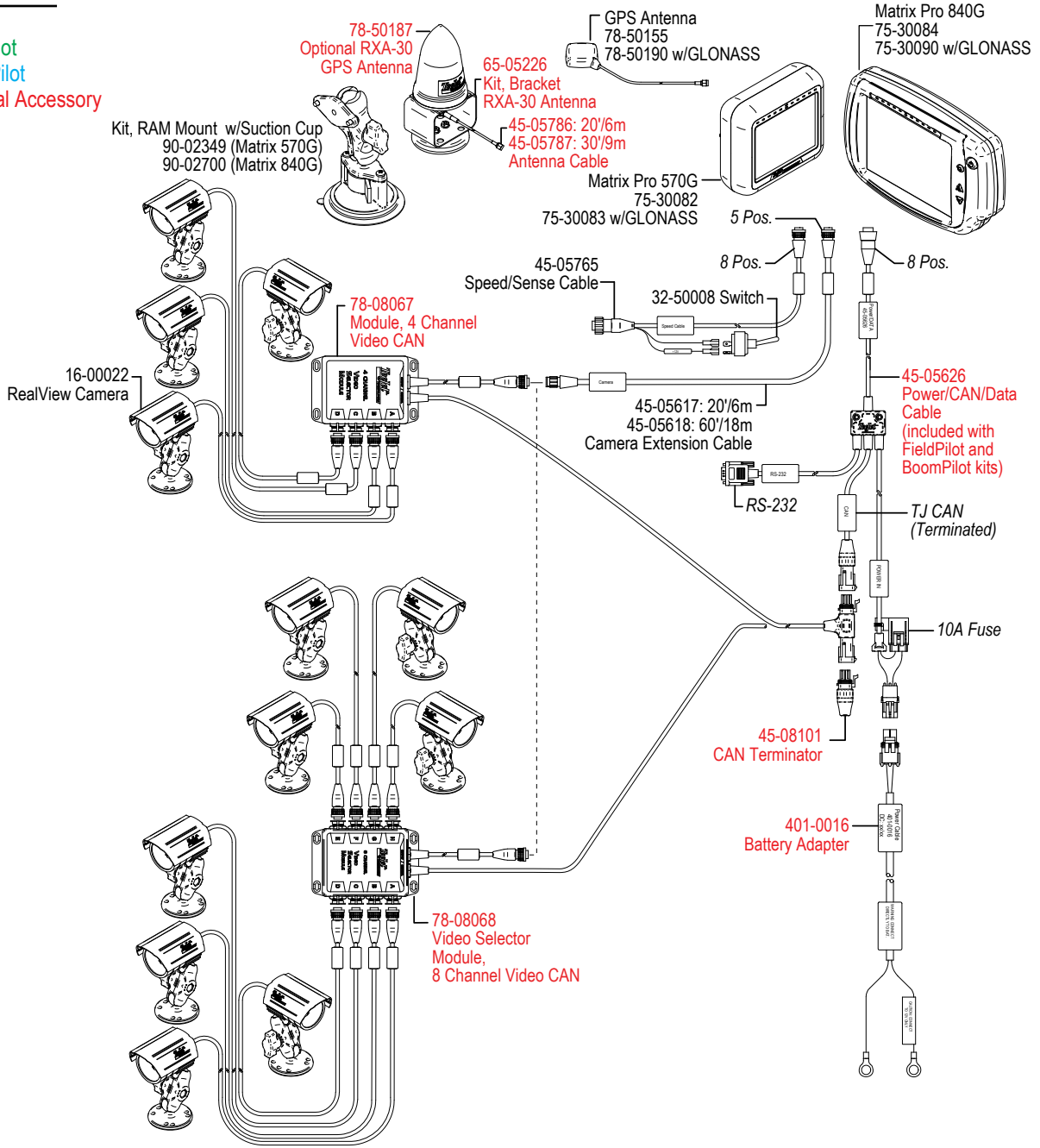


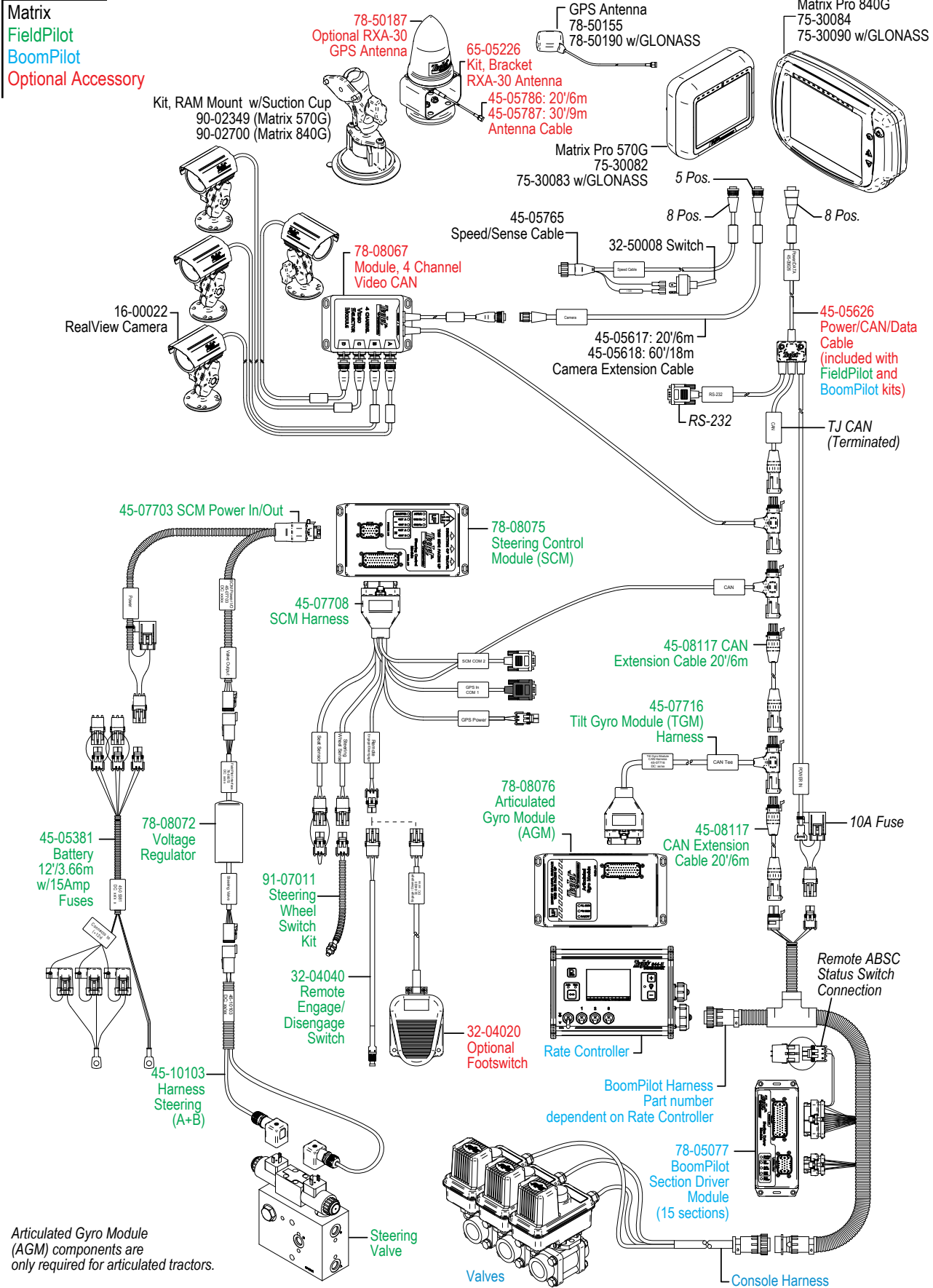
Figure 1-8: Matrix Pro w/8 Channel or 4 Channel VSM & Multiple RealView Cameras

Matrix  
FieldPilot  
BoomPilot  
Optional Accessory



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Figure 1-9: Matrix Pro w/VSM & Multiple RealView Cameras, FieldPilot and BoomPilot



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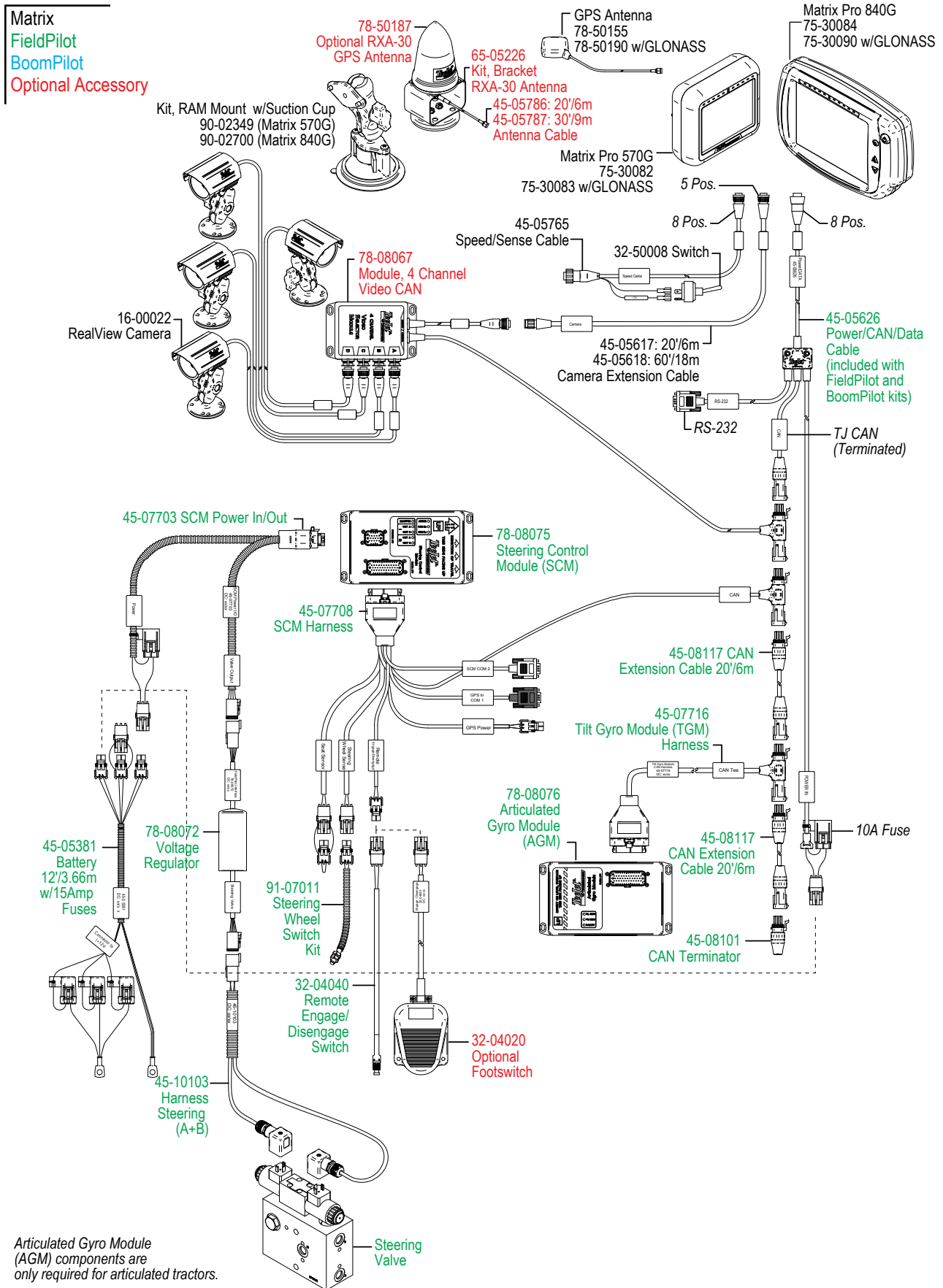
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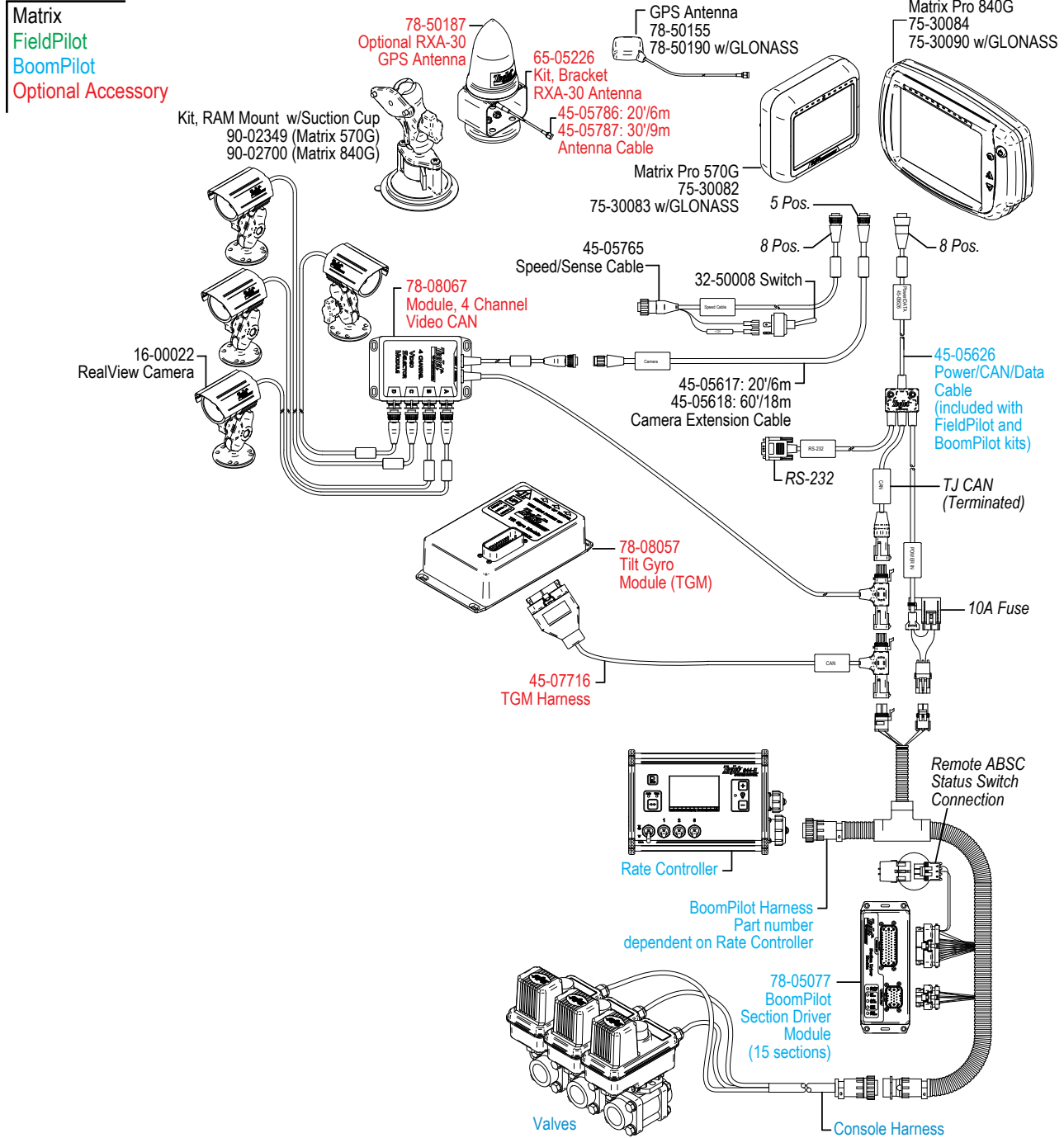
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Figure 1-10: Matrix Pro w/VSM & Multiple RealView Cameras and FieldPilot



Articulated Gyro Module (AGM) components are only required for articulated tractors.

Figure 1-11: Matrix Pro w/VSM, Tilt Gyro and BoomPilot




## CHAPTER 2 – POWER

### Power On

Press the POWER BUTTON  to power on the console.

Upon power up, the Matrix Pro will begin its Start Up Sequence.

### Power Off

Press and briefly hold the POWER BUTTON  until a confirmation screen acknowledges shut down mode.

**WARNING!** Wait 30 seconds before restarting the console after powering off.

Figure 2-1: Power Button

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### Start Up Sequence

The console takes approximately 40 seconds to power up. During this time a series of screen including the TeeJet Technologies logo, a globe, an hourglass and an information screen will be displayed (LEDs will power on and off and brightness levels will fluctuate.) Once the power up sequence has completed, the Home screen will appear.

Figure 2-2: Home Screen - Simple Mode

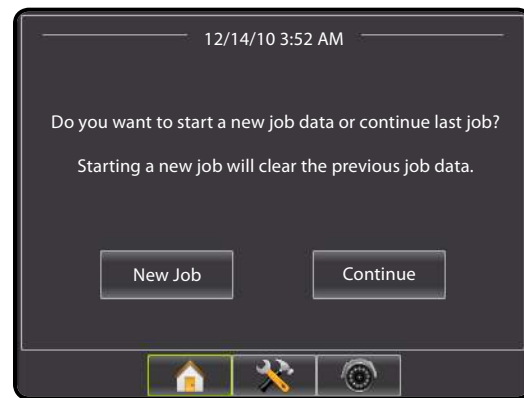


Figure 2-3: Home Screen - Advanced Mode



## CHAPTER 3 – INTRODUCTION

The Matrix Pro can be used as a simple current job system or advanced multi-job system. Regardless of which mode the console is in, the basic screen functions are the same.

- Bottom Tab Keys and Side Tab Keys access the various screens and sub-screens
- Warnings and Information Pop-ups inform of console activities and details on setup or guidance functions
- Setup options can easily be set using the drop down menus or keyboard entry screens

To quickly find a setup feature, see the Unit Setup Mode Menu Structure chart.

For full functionality of the Matrix Pro's abilities be sure to setup the required setup options.

### JOBS - HOME SCREEN

Setup for the specific vehicle and its components must be completed before starting a job. Once a job is active, some setup options are not available to be changed. See the Unit Setup Mode Menu Structure chart in the introduction chapter or setup chapter for details.

#### Simple Mode

In simple mode, only one job will be available at a time. Only bounded and applied area are displayed on the home screen. Only the current job is available for saving in Reports, and use with Fieldware Link is not available.

#### Advanced Mode






In advanced mode, more than one job will be available at any time. Client, farm, field, job, bounded area and applied area are displayed on the home screen. The Job name is the only information that can be entered using the console. All saved jobs can be saved in Reports. With Fieldware Link, a user can input client, farm and field data as well as duplicate/edit jobs for reuse of boundaries and guidelines. Client, Farm and Field information can only be inputted using Fieldware Link.

### BASIC SCREEN USE

#### Bottom Tab Keys

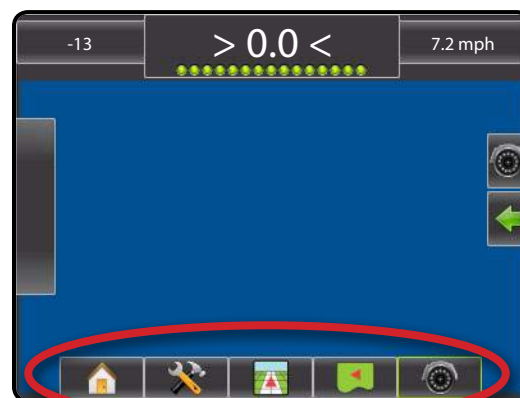
The bottom tab keys are always available on screen. These keys give access to jobs, setup options and navigation.

Five bottom tabs are:

-  Home/Job Screen
-  Unit Setup
-  Vehicle View Guidance
-  Field View Guidance
-  RealView Guidance or RealView Camera Full Screen Video View

*NOTE: RealView Guidance options are only available with a camera installed on the system.*

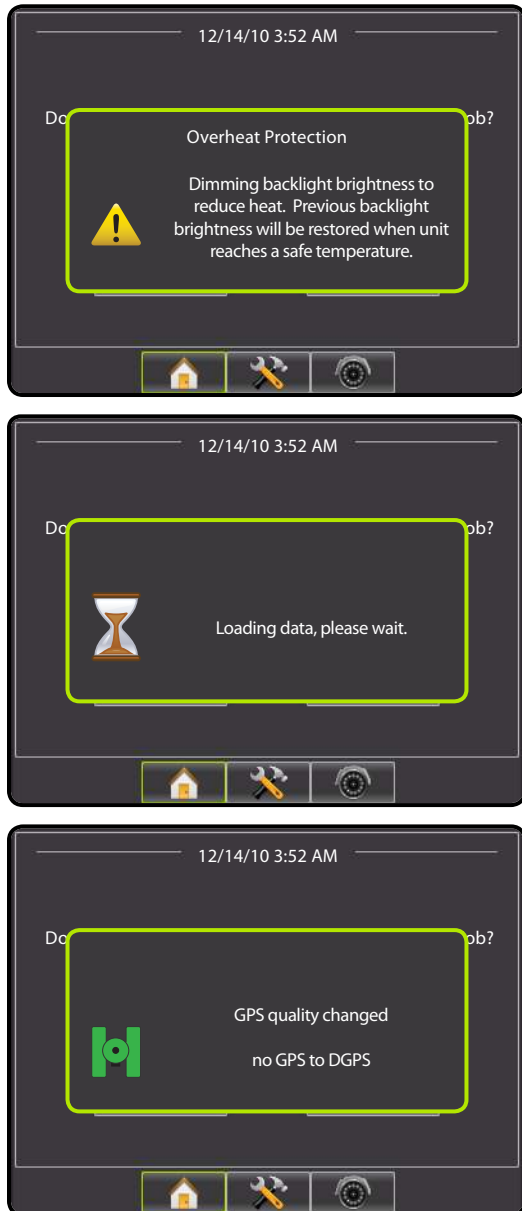
Figure 3-1: Bottom Tab Keys



### Warnings and Information Pop-ups

A pop-up warning or information box will be displayed for approximately five (5) seconds. To remove the information box, tap anywhere on the screen.





Figure 3-2: Information Screens



### Setup Screens

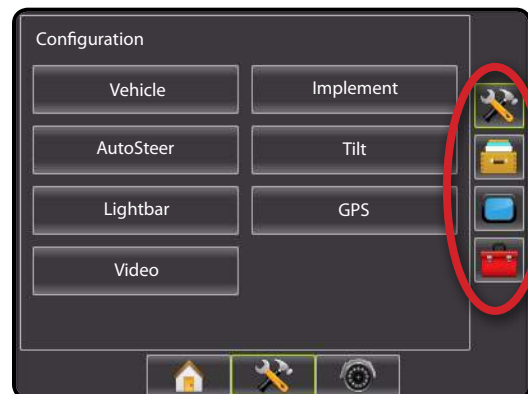
#### Side Tab Keys in Unit Setup

Four side tabs on the Unit Setup screen access setup options for:

-  Vehicle/Implement Configuration
  - Vehicle (Vehicle Type, Antenna Height, Direction to Boom, Distance to Boom)
  - Implement (Number of Sections, Guidance Width, Spray Width, Overlap, Delay On, Delay Off)
  - AutoSteer (Valve Type, Frequency, Minimum Duty Cycle Left/ Right, Maximum Duty Cycle, Coarse Adjustment, Deadband, Fine Adjustment, Lookahead, Valve Test, Valve Diagnostics, Steering Wheel Sensor, Steering Angle Sensor)
  - Tilt Configuration
  - Lightbar (Brightness, Mode, LED Spacing)
  - GPS (GPS Type, GPS Port, GPS Information)
  - Video Configuration
-  Data Management
  - Manage Data (delete a job or duplicate a job's Guideline Data, Boundary Data and/or Applied Data)
  - Transfer (Delete, Import or Export Job Data)
  - Reports (Save PDF, KML and/or SHP file)
  - Job Mode
-  Console Settings
  - Display (Color Scheme, Brightness, Screenshot, Calibrate)
  - Cultural (Units, Language, Time Zone)
  - Sound (Volume)
  - About System Information
-  Tools (Calculator, Units Converter)

*NOTE: All settings are automatically saved when selected.*

Figure 3-3: Side Tab Keys in Unit Setup



### Setup Option Information

Press the option's icon or option's name of any menu item to display a definition and range values of that item. To remove the information box, press anywhere on the screen.

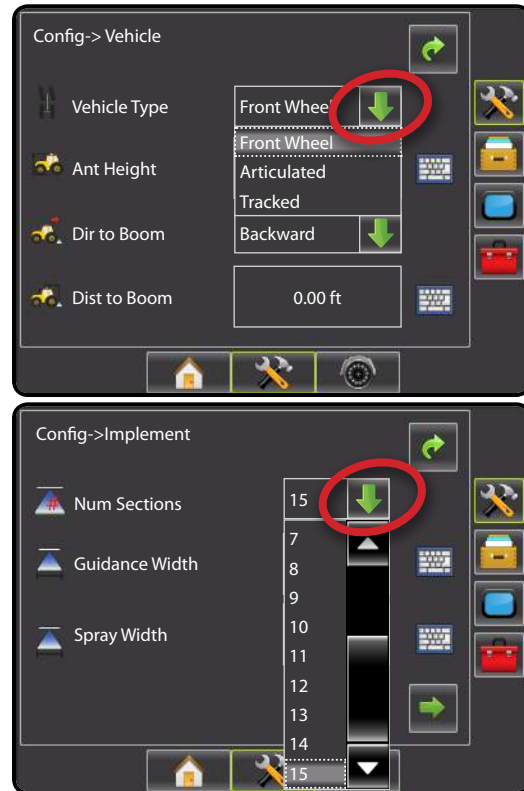
Figure 3-4: Example of Information Text Box



### Drop Down Menu Selections

Press DOWN arrow ↓ to access the list of options. Use the UP/DOWN arrows ▲ ▼ or slide bar if necessary to scroll through the extended list. Select the appropriate option. To close the list without selecting an option, tap anywhere on the screen outside the drop down menu.

Figure 3-5: Example of Drop Down Menu



### Keyboard Entry Screen




Press the KEYPAD icon . Press **Clear** to erase the existing value. Use the numeric keypad to enter a value. Press the ACCEPT icon  to save the settings or the CANCEL icon  to leave the keypad without saving.

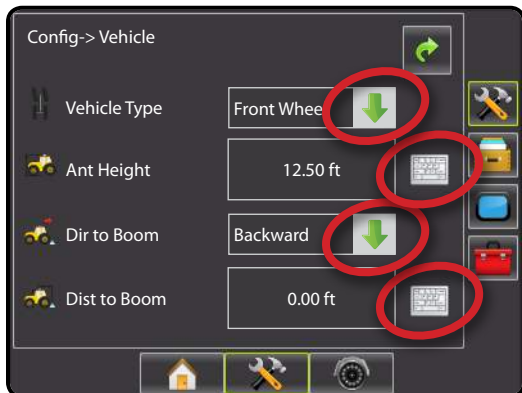
Figure 3-6: Example of Keyboard



### Unavailable Options When Job is Activate

When a job is active some setup options are unavailable. See the Unit Setup Mode Menu Structure Chart for indication of which options are not accessible.

Figure 3-7: Example of Unavailable Options



### Light or Dark Console Screen




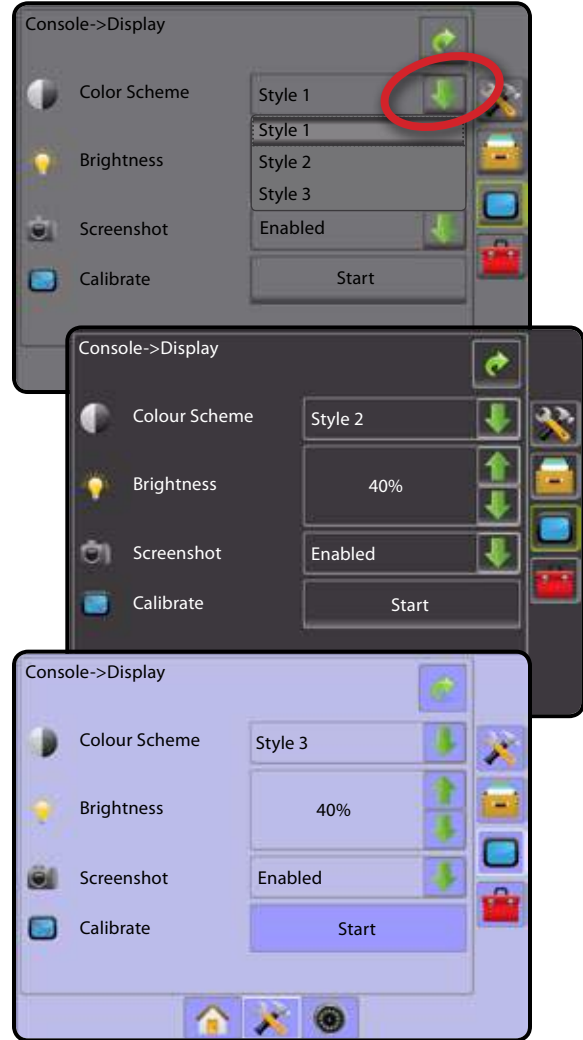
The console is available in three color schemes. From the Unit Setup Bottom Key, press CONSOLE side tab  and enter the **Display** options. Press DOWN arrow  to access the Color Scheme  options to select color mode.

Figure 3-8: Color Scheme



UNIT SETUP MODE MENU STRUCTURE

Configuration (page 35)		Job*	
Vehicle	Vehicle Type	✗	
	Antenna Height	✗	
	Direction to Boom	✗	
	Distance to Boom	✗	
Implement	Number of Sections	✗	
	Guidance Width	✗	
	Spray Width	✗	
	Overlap	✓	
	Delay On	✓	
	Delay Off	✓	
AutoSteer	Enable	✓	
	Valve Setup	Valve Type	✗
		Frequency	✗
		Minimum Duty Cycle Left	✗
		Minimum Duty Cycle Right	✗
	Steering Settings	Maximum Duty Cycle	✗
		Coarse Adjustment	✓
		Deadband	✓
		Fine Adjustment	✓
		Lookahead	✓
	Valve Test	✗	
	Valve Diagnostics	✗	
	Options	Steering Wheel Sensor	✗
		Angle Sensor	Enable
Tilt	Calibrate Sensor	✓	
	Offset Adjustment	✓	
Lightbar	Enabled	✓	
	Brightness	✓	
	Field Level	✓	
GPS	Mode	✓	
	LED Spacing	✓	
	GPS Type	✗	
Video	GPS Port	✗	
	GPS Status	✓	
Cameras		✓	

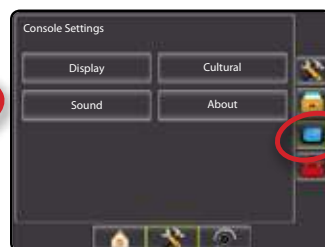
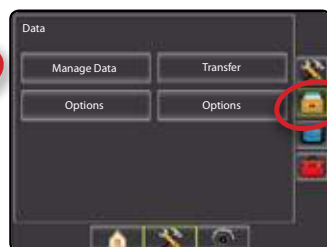
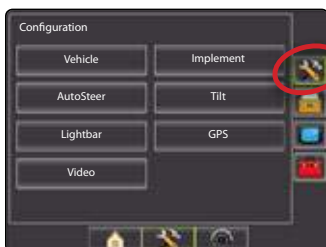
Data Management (page 61)		Job*
Manage Data	Duplicate	✗
	Delete Job Data	✗
Transfer	Export Job Data	✗
	Import Job Data	✗
	Delete Job Data	✗
Reports	Save PDF	✗
	Save KML	✗
	Save SHP	✗
	Save All Types	✗
Options	Job Mode	✗

Console Settings (page 70)		Job*
Display	Color Scheme	✗
	Brightness	✓
	Screenshot	✓
	Calibrate	✓
Cultural	Units	✓
	Language	✓
	Time Zone	✓
Sound	Volume	✓
About	System Information	✓
	Save System Info	✓

Tools (page 75)		Job*
Extras	Calculator	✓
	Units Converter	✓

✓ Available during an active job

✗ Not Available during an active job



## Guidance

The Matrix Pro allows product application and vehicle guidance to be performed simultaneously. Once Unit Setup is complete, guidance can begin. Five guidance modes allow the operator to optimize the field work: Straight AB (→), Curved AB (↷), Circle Pivot (⊙), Last Pass (↻) and NextRow (↓). Additional optimization can be accomplished with Boundary Application (🗺), Curved Lookahead (👁), Return to Point (📍) guidance and RealView Guidance Over Video (📹). Three guidance screens keep the user informed.

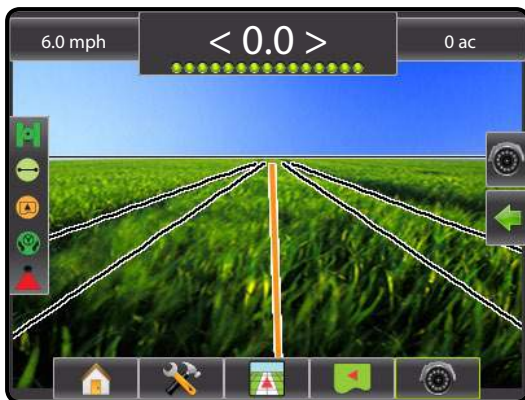
Vehicle View Guidance (📹) creates a computer-generated image of the vehicle position displayed in the application area



Field View Guidance (📹) creates a computer-generated image of the vehicle position and application area from an aerial perspective.



RealView Guidance (📹) allows live video input to be displayed instead of a computer-generated image.



## Side Tab Keys in Guidance

Two side tabs on the Guidance screens access setup options for:

### Navigation and Guidance Options

- Guidance mode
- Next guideline
- Mark A or mark B
- Azimuth guidance
- Create boundary
- Mark and return to point
- BoomPilot

### RealView Guidance

- Single or split camera view
- Guidance over video
- Steering angle indicator

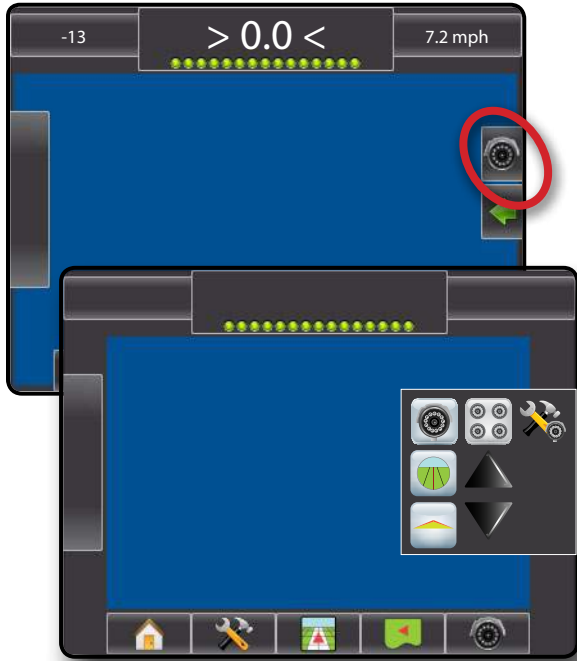
NOTE: All settings are automatically saved when selected.

Figure 3-9: Navigation and Guidance Options\*



\* Simulated screen example to show all possibilities.

Figure 3-10: RealView Options\*



\* Simulated screen example to show all possibilities.

### Guidance Bar Selectable Information

Press the left or right section of the guidance bar to change the selectable job information.

Figure 3-11: Selectable Job Information



### Status/Information Screens

Status and information regarding the status bar icons can be accessed by pressing the icon on the status bar.

GPS Status displays information regarding data rates, number of satellites in view, and satellite quality and ID.

Guidance Mode Status displays information regarding the pattern of guidance, name of the current guideline and how many guidelines are saved in the console.

Bounded Area Status displays information regarding the areas in the current boundaries.

Assisted/Auto Steering Status displays information regarding the current status of the auto steering system.

BoomPilot Status displays information regarding the current status of the BoomPilot system

Figure 3-12: GPS Status



## Required- Setup Options

A series of setup options are required for guidance to properly function. These should be setup before starting a job as they are not available after a job has been started.

### Cultural Setup







1. Press CONSOLE side tab .
2. Press **Cultural**.
3. Select from:
  - ▶ Units  – defines the system measurements
  - ▶ Language  – defines the system language
  - ▶ Time Zone  – establishes the local time zone.
4. Press RETURN arrow  or CONSOLE side tab  to return to the main Console screen.

Figure 3-13: Cultural Options



### GPS
















1. Press CONFIGURATION side tab .
2. Press **GPS**.
3. Select from:
  - ▶ GPS Type  – select GPS source transmissions
  - ▶ GPS Port  – sets (D)GPS COM port
  - ▶ GPS Status  – displays information for TeeJet Customer Service use on GGA/VTG (Data Rates), Number of Satellites, HDOP, PRN, GGA Quality, GPS Receiver and Receiver Version
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 3-14: GPS



### Implement Setup

When a SmartCable or Section Driver Module (SDM) is not present only a single boom setup is available. Configurations for Overlap, Delay On and Delay Off will not be available, and Number of Sections will be set to one.

1. Press CONFIGURATION side tab .
2. Press **Implement**.
3. Select from:
  - ▶ Number of Boom Sections  – establishes the number of boom sections
  - ▶ Guidance Width  – establishes the width between guidelines
  - ▶ Spray Width  – establishes the width of each boom section for a total spray width
  - ▶ Overlap  – determines the amount of overlap allowed
  - ▶ Delay On  – establishes the timing for the boom section valves to switch on
  - ▶ Delay Off  – establishes the timing for the boom section valves to switch off
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.



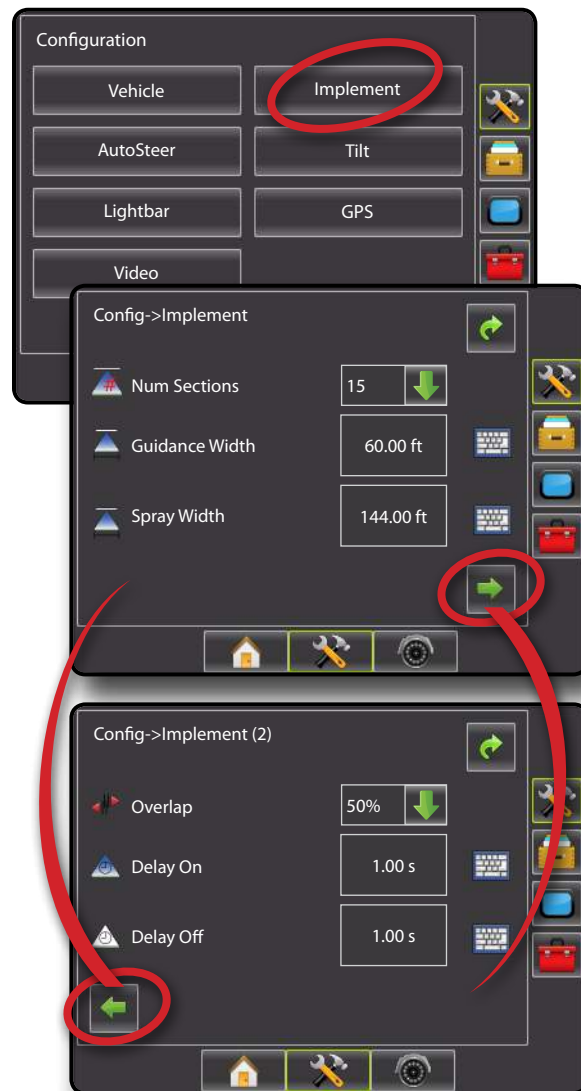
NOTE: Press  or  to switch between Implement setup screens.

Figure 3-15: Implement Setup Options



## Vehicle Setup








1. Press CONFIGURATION side tab .
2. Press **Vehicle**.
3. Select from:
  - ▶ Vehicle Type  – selects the type of vehicle that most closely represents your vehicle
  - ▶ Antenna Height  – sets the height of the antenna from the ground
  - ▶ Direction to Boom  – sets whether the boom is located behind or in front of the GPS antenna
  - ▶ Distance to Boom  – defines the distance from the GPS antenna to the boom
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 3-16: Vehicle Setup Options



## AutoSteer Setup

When a Steering Control Module (SCM) is present, Assisted/Auto Steering options will be available. For detailed setup instructions, refer to your specific assisted/auto steering installation manual.

*NOTE: An update of your SCM software will also be required when updating an existing Matrix console to Matrix Pro.*




1. Press CONFIGURATION side tab .
2. Press **AutoSteer**.
3. Select:
  - ▶ On – enabled
  - ▶ Off – disabled
4. Select from:
  - ▶ Valve Setup – used to configure Valve Type, Valve Frequency, Minimum Duty Cycle Left, Minimum Duty Cycle Right and Maximum Duty Cycle
  - ▶ Steering Settings – used to establish Coarse Adjustment, Fine Adjustment, Deadband and Lookahead
  - ▶ Valve Test – used to verify if steering is directed correctly
  - ▶ Valve Diagnostics – used to test the valves to see if they are connected properly
  - ▶ Options: Steering Wheel Sensor – used to select whether the steering disengage sensor is magnetic or pressure based
  - ▶ Angle Sensor – used to establish the Steering Angle Sensor (SAS) as the primary feedback sensor for auto steering, calibrate the SAS and set an offset adjustment.
5. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 3-17: AutoSteer



## CHAPTER 4 – JOBS / HOME SCREEN

Once the power up sequence has completed, the Home screen will appear with the option to start a new job or continue an existing job.

The console must have GPS before starting or continuing job.

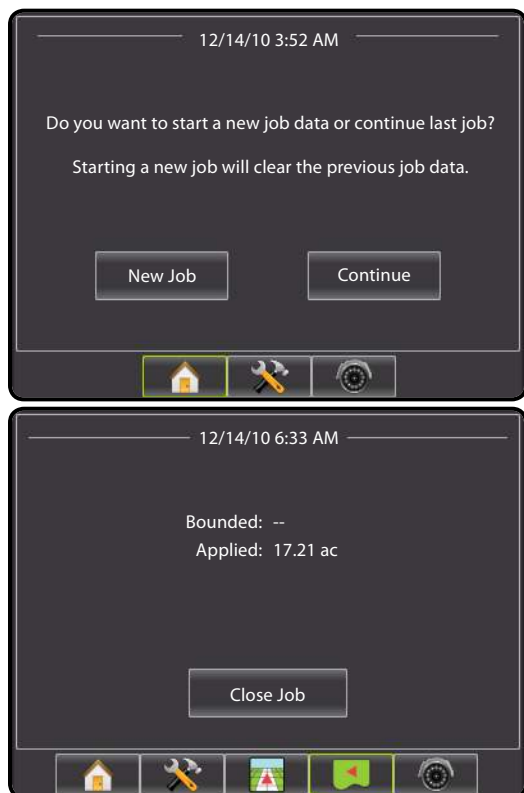
**Setup for the specific vehicle and its components must be completed before starting a job.** Once a job is active, some setup options are not available to be changed. See the Unit Setup Mode Menu Structure chart in the introduction chapter or setup chapter for details.

To change between simple mode and advanced mode, see the configuration chapter under Data Management – Options.

### Simple Mode

In simple mode, only one job will be available at a time. Only bounded and applied area are displayed on the home screen. Only the current job is available for saving in Reports, and use with Fieldware Link is not available.

Figure 4-1: Simple Mode Home Screen



### Advanced Mode

In advanced mode, more than one job will be available at any time. Client, farm, field, job, bounded area and applied area are displayed on the home screen. The Job name is the only information that can be entered using the console. All saved jobs can be saved in Reports. With Fieldware Link, a user can input client, farm and field data as well as duplicate/edit jobs for reuse of boundaries and guidelines. Client, Farm and Field information can only be inputted using Fieldware Link.

Figure 4-2: Advanced Mode Home Screen



SIMPLE MODE

Once the power up sequence has completed, the Home screen will appear with the option to start a new job or continue an existing job.

In simple mode, only one job will be available at a time. Only bounded and applied area are displayed on the home screen. Only the current job is available for saving in Reports. Job specific information input with Fieldware Link is not available.

The console must have GPS before starting or continuing a job.

Figure 4-3: GPS Not Available



Figure 4-4: Home Screen with Acquired GPS

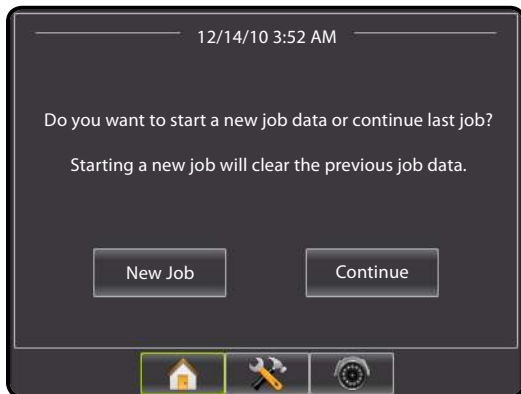
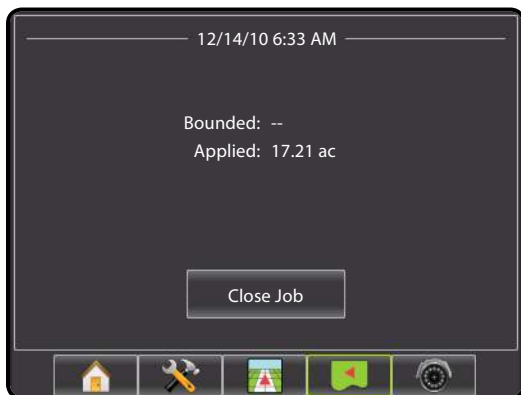


Figure 4-5: Home Screen with Job Active



New Job

To start a New Job:

1. Press **New Job**.

The console will jump to Vehicle View.

Figure 4-6: Start New Job with No Previous Job Started



Starting a new job will clear the previous job data.

To start a New Job:

1. Press **New Job**.
2. "Starting new job will delete the previous job."
  - Select:
    - ▶ OK – to create a new job and delete the last job
    - ▶ Cancel – to return to the Home screen without starting a new job

The console will jump to Vehicle View.

Figure 4-7: Start New Job, Deleting Previous Job



## Continue Job

To continue the existing job:

1. Press **Continue**.
2. The console will jump to Vehicle View and begin providing navigation information.

Figure 4-8: Continue the Existing Job



## Close Job

To close a job:


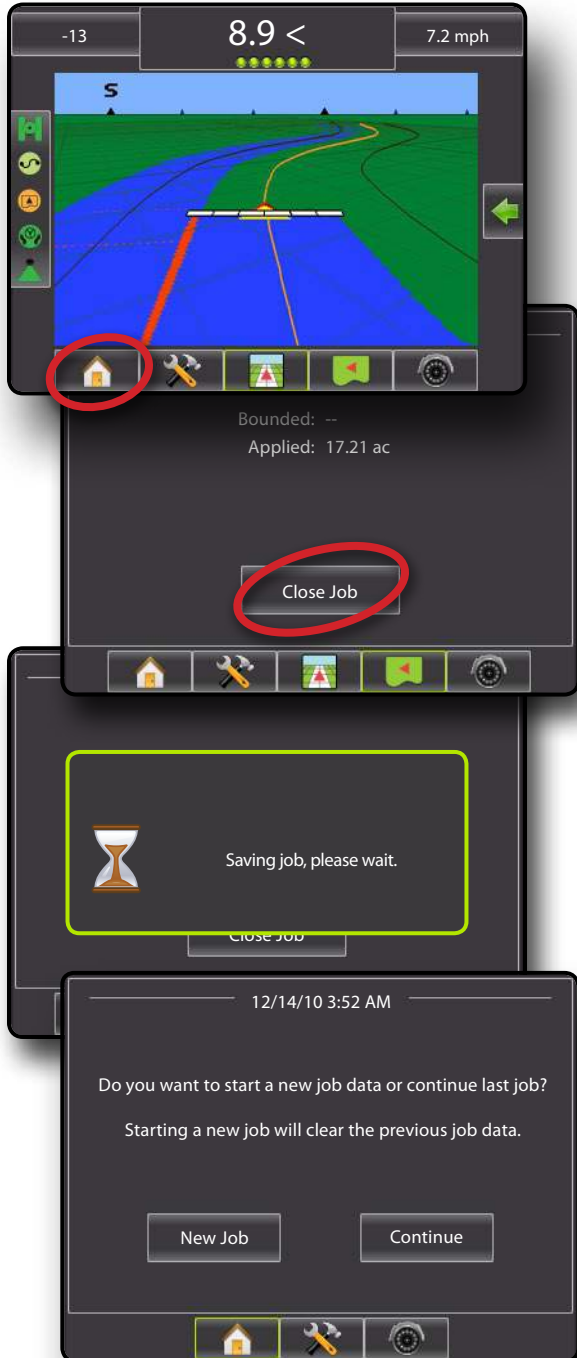
1. Press HOME bottom tab .
2. Press **Close Job**.

Figure 4-9: Close a Job



## Close Job and Save Reports

When closing a job with a USB drive in the console, you get the option to create a report on the current job.

To create a report of the job:


1. Insert a USB drive into the USB port of the console.
2. Press HOME bottom tab .
3. Press **Close Job**.
4. Select:
  - ▶ Yes – to create a report of the last job
  - ▶ No – to return to the Home screen without saving

Figure 4-10: Close Job and Save Reports



ADVANCED MODE

Once the power up sequence has completed, the Home screen will appear with the option to start a new job or continue an existing job.

In advanced mode, more than one job will be available at any time. Client, farm, field, job, bounded area and applied area are displayed on the home screen. The Job name is the only information that can be entered using the console. All saved jobs can be saved in Reports. With Fieldware Link, a user can input client, farm and field data as well as duplicate/edit jobs for reuse of boundaries and guidelines. Client, Farm and Field information can only be inputted using Fieldware Link.

The console must have GPS before starting or continuing a job.

Figure 4-11: GPS Not Available



Figure 4-12: Home Screen with Acquired GPS



Figure 4-13: Home Screen with Job Active



New Job

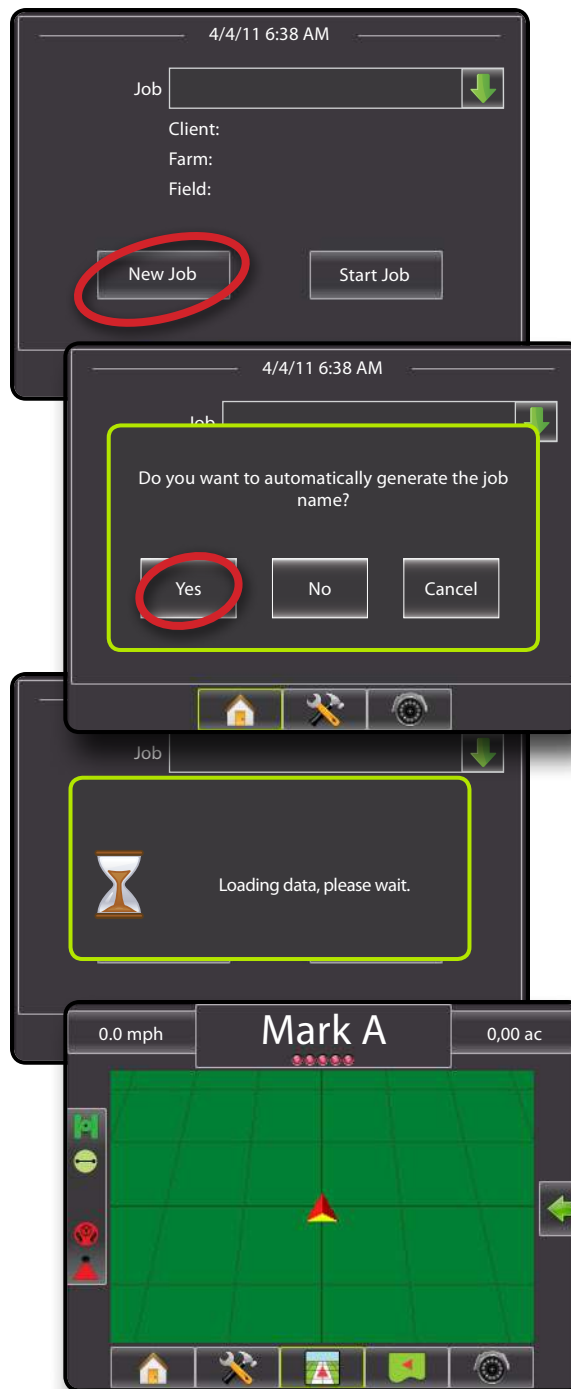
To start a New Job with an automatically generated name:

1. Press **New Job**.
2. Press **Yes** to automatically generate a name.
  - ▶ No – to enter a name using the on screen keyboard

Client, farm and field information are inputted using Fieldware Link.

The console will jump to Vehicle View.

Figure 4-14: New Job with Automatic Name



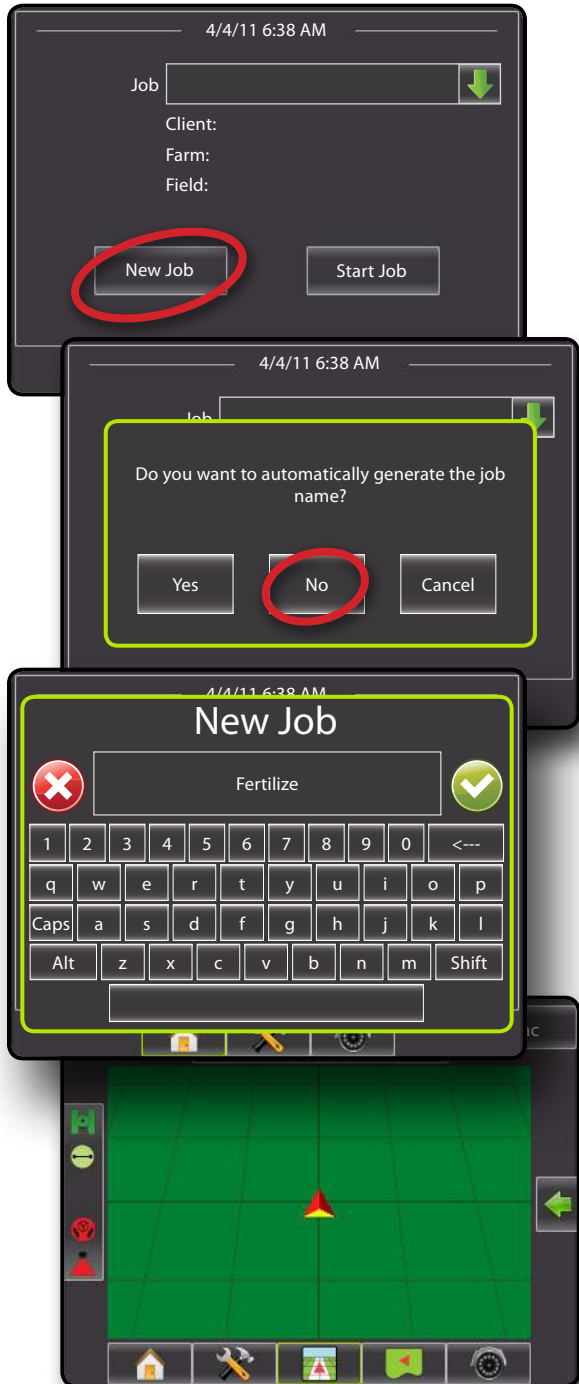
To start a New Job with a custom name:

1. Press **New Job**.
2. Press **No** to enter a name using the on screen keyboard.
  - ▶ Yes – to automatically generate a name

Client, farm and field information are inputted using Fieldware Link.

The console will jump to Vehicle View.


Figure 4-15: New Job with a Custom Name



## Start Job

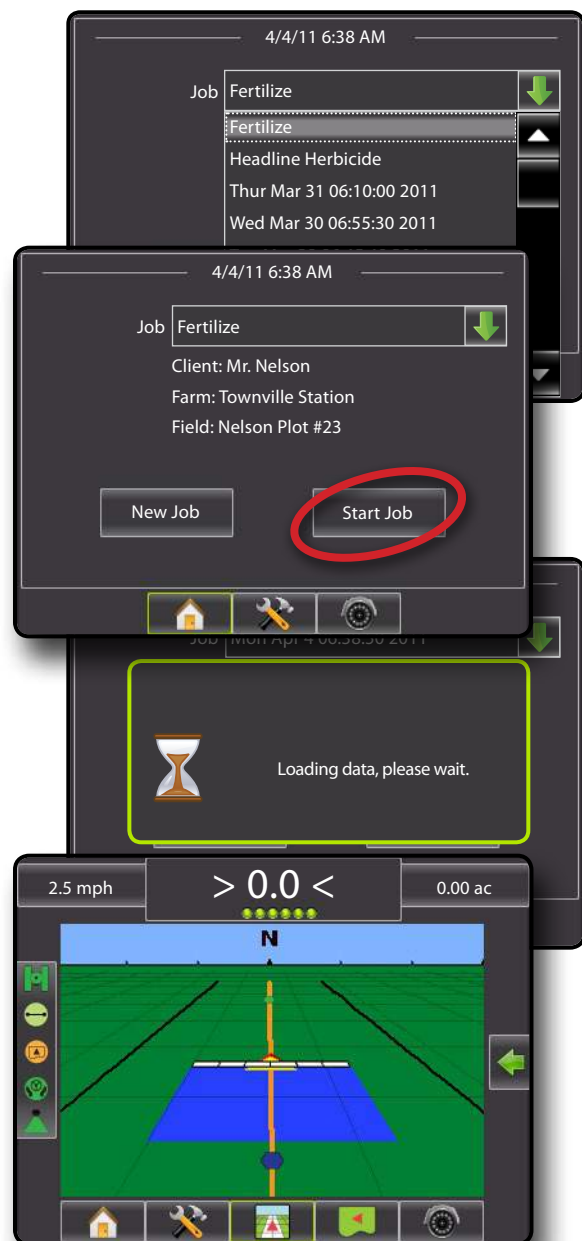
The Matrix Pro is programmed with a field finder tool to assist the user in finding the job closest to the vehicle's location. With GPS acquired, the job pick list will be updated every ten seconds. During this update, the list of jobs is sorted by distance and the closest two jobs are displayed on the top of the list. The remaining jobs are listed beneath these.

To continue an existing job:

1. Press DOWN arrow  to access the list of jobs saved in the console.
2. Select the job name to be started/continued.
3. Press **Start Job**.

The console will jump to Vehicle View and begin providing navigation information.

Figure 4-16: Continue an Existing Job



### Close Job

To close a job:


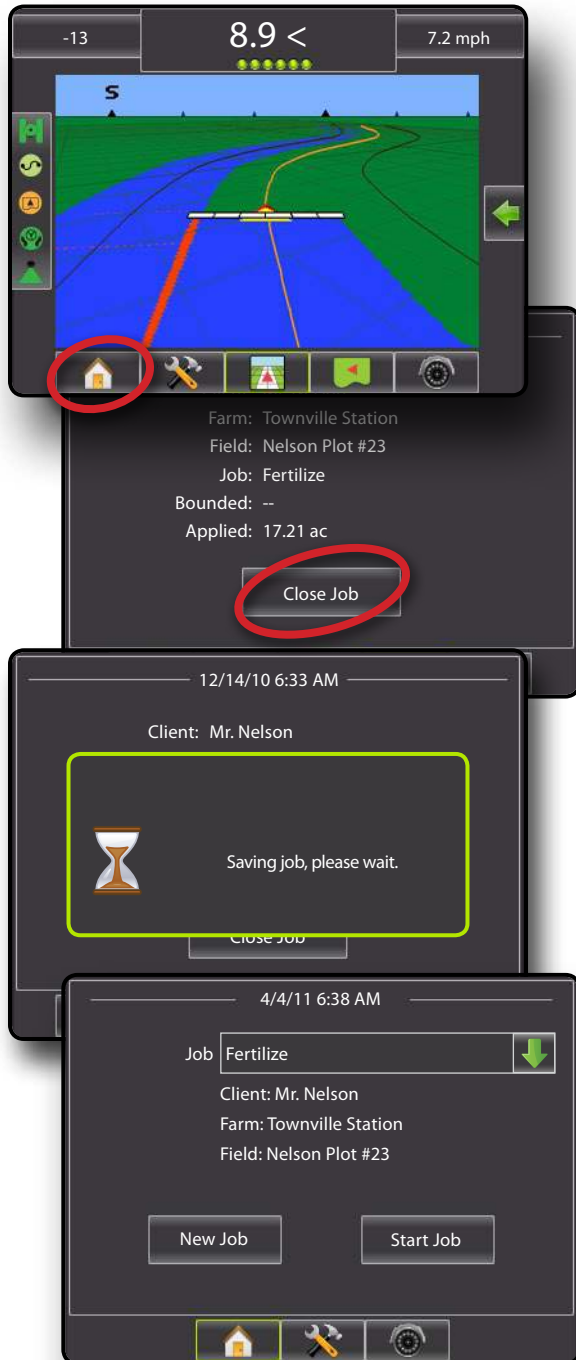
1. Press HOME bottom tab .
2. Press **Close Job**.

Figure 4-17: Close a Job



### Close Job and Save Reports

When closing a job with a USB drive in the console, you get the option to create a report on the current job.

To create a report of the job:


1. Insert a USB drive into the USB port of the console.
2. Press HOME bottom tab .
3. Press **Close Job**.
4. Select:
  - ▶ Yes – to create a report of the last job
  - ▶ No – to return to the Home screen without saving

Figure 4-18: Close Job and Save Reports



## CHAPTER 5 – FULL SCREEN VIDEO VIEW

RealView Full Screen Video View allows live video input to be displayed. View video feed(s) and setup cameras without GPS available. Options for RealView Guidance are not available on this screen.

If a Video Selection Module (VSM) is installed on the system, two (2) video options are available:

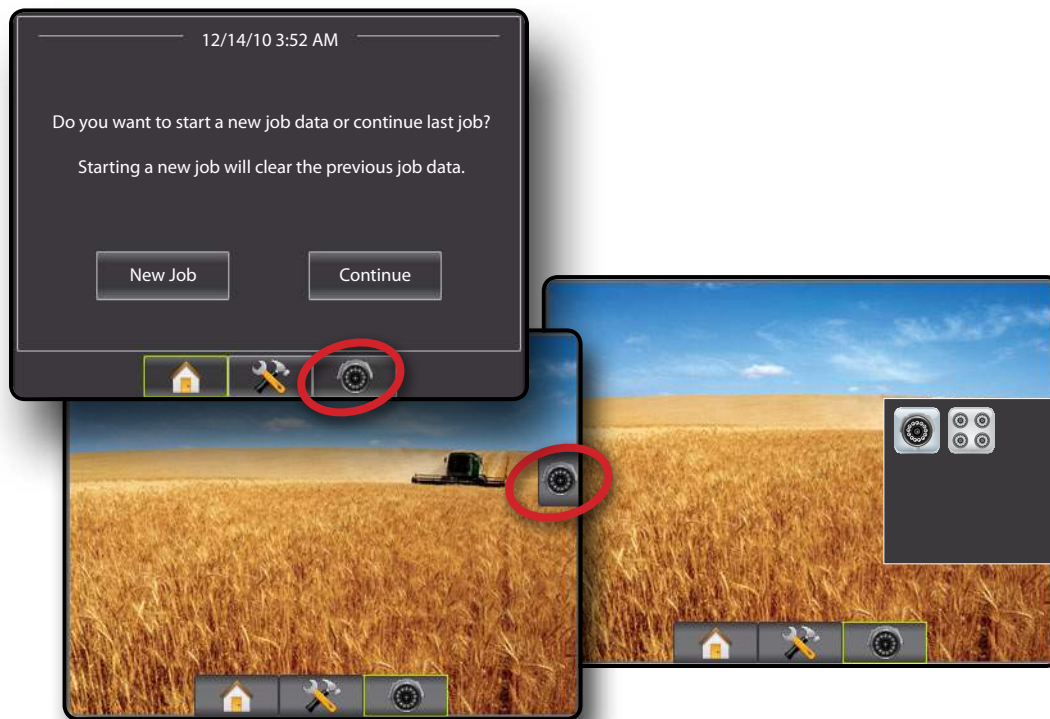
- Single Camera View – one (1) of up to eight (8) camera inputs can be selected to change the view of the video input.
- Split Camera View – one (1) of two (2) sets of four (4) camera inputs (A/B/C/D or E/F/G/H) can be selected to divide the screen into four (4) separate video feeds.

RealView Guidance options also include guidance over video and a steering angle indicator.

### RealView Full Screen Video View

1. Press REALVIEW CAMERA FULL SCREEN VIDEO VIEW bottom tab .

Figure 5-1: RealView Camera Full Screen Video View



## VSM Not Installed




If a VSM is not installed, the REALVIEW OPTIONS icon  (and therefore the VIDEO icon  and SPLIT VIEW icon ) is not available and only one (1) video feed will be available.

Figure 5-2: VSM Not Installed



## Inactive Camera Port

When a selected camera feed is not available, a blue screen with the TeeJet logo will fill the screen of that port's screen quarter.

Figure 5-3: Inactive Camera Ports



## Single Camera Selection

One (1) of up to eight (8) camera views can be activated in RealView Guidance if a Video Selection Module (VSM) is attached.

When an eight (8) channel VSM is on the system, up to eight (8) cameras can be installed. When a four (4) channel VSM is on the system, up to four (4) cameras can be installed.

To change active a single camera view:








1. Press REALVIEW OPTIONS icon  to display RealView options
2. Press the VIDEO icon .
3. Select the desired CAMERA , , , , , ,  or  to change the active video feed.

Figure 5-4: Camera Selection





## Split Camera View

Split Camera View allows one (1) of two (2) sets of four (4) camera inputs (A/B/C/D or E/F/G/H) to be selected to divide the screen into four (4) separate video feeds while in RealView Guidance if a Video Selection Module (VSM) is attached.

When an eight (8) channel VSM is on the system, up to eight (8) cameras can be installed. When a four (4) channel VSM is on the system, up to four (4) cameras can be installed.

To change the active set of split camera views:





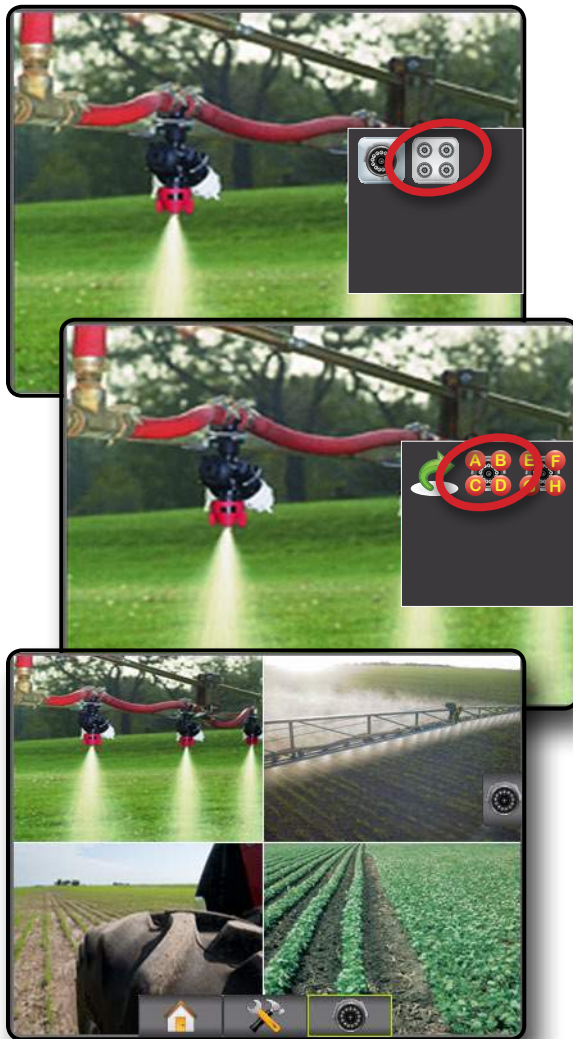
1. Press REALVIEW OPTIONS icon  to display RealView options.
2. Press the SPLIT VIEW icon .
3. Select:
  - ▶ Cameras A/B/C/D 
  - ▶ Cameras E/F/G/H 

Figure 5-5: Select Split View




## CHAPTER 6 - SYSTEM SETUP

System Setup is used to configure the console, the vehicle and its implements. Four side tabs access options for Vehicle/Implement Configuration, Data Management, Console Settings and Tools.

### OVERVIEW

Four side tabs access setup options for:

-  Vehicle/Implement Configuration
  - Vehicle (Vehicle Type, Antenna Height, Direction to Boom, Distance to Boom)
  - Implement (Number of Sections, Guidance Width, Spray Width, Overlap, Delay On, Delay Off)
  - AutoSteer (Valve Type, Frequency, Minimum Duty Cycle Left/Right, Maximum Duty Cycle, Coarse Adjustment, Deadband, Fine Adjustment, Lookahead, Valve Test, Valve Diagnostics, Steering Wheel Sensor, Steering Angle Sensor)
  - Tilt Configuration
  - Lightbar (Brightness, Mode, LED Spacing)
  - GPS (GPS Type, GPS Port, GPS Information)
  - Video Configuration

 Data Management

- Manage Data (delete a job or duplicate a job's Guideline Data, Boundary Data and/or Applied Data)
- Transfer (Delete, Import or Export Job Data)
- Reports (Save PDF, KML and/or SHP file)
- Job Mode

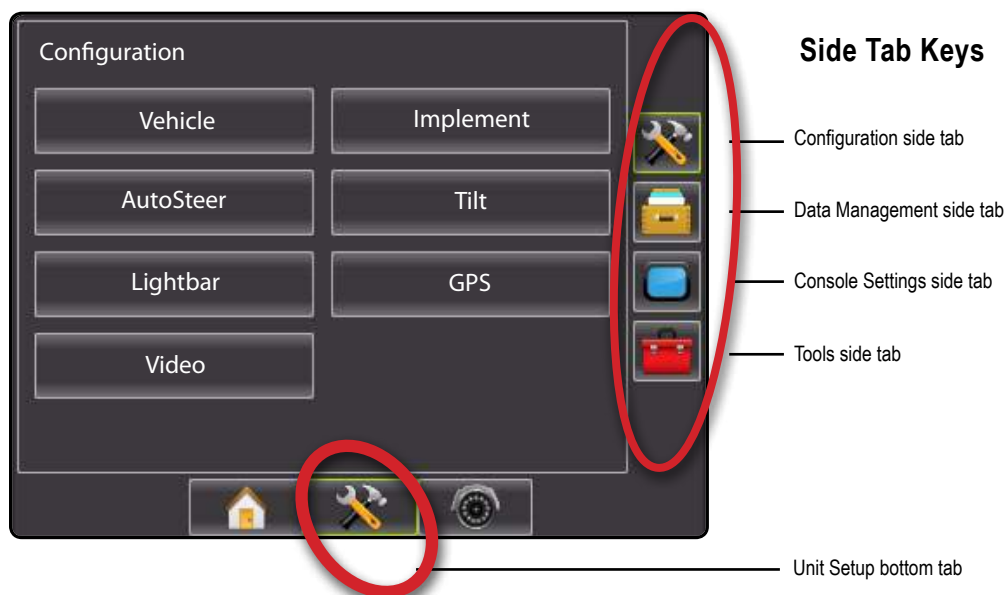
 Console Settings

- Manage Data (copy or delete Guideline Data, Boundary Data and/or Applied Data)
- Cultural (Units, Language, Time Zone)
- Sound (Volume)
- About System Information

 Tools (Calculator, Units Converter)

*NOTE: All settings are automatically saved when selected.*

Figure 6-1: Setup Options



OVERVIEW

POWER

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HOME

FULL SCREEN

SETUP

GUIDANCE

APPENDIX

## UNIT SETUP MODE MENU STRUCTURE

Configuration (page 35)		Job*	
Vehicle	Vehicle Type	✗	
	Antenna Height	✗	
	Direction to Boom	✗	
	Distance to Boom	✗	
Implement	Number of Sections	✗	
	Guidance Width	✗	
	Spray Width	✗	
	Overlap	✓	
	Delay On	✓	
	Delay Off	✓	
AutoSteer	Enable	✓	
	Valve Setup	Valve Type	✗
		Frequency	✗
		Minimum Duty Cycle Left	✗
		Minimum Duty Cycle Right	✗
	Steering Settings	Maximum Duty Cycle	✗
		Coarse Adjustment	✓
		Deadband	✓
		Fine Adjustment	✓
	Lookahead	✓	
	Valve Test	✗	
	Valve Diagnostics	✗	
	Options	Steering Wheel Sensor	✗
		Angle Sensor	✓
Angle Sensor	Enable	✓	
	Calibrate Sensor	✓	
Offset Adjustment	✓		
Tilt	Enabled	✓	
	Field Level	✓	
Lightbar	Brightness	✓	
	Mode	✓	
	LED Spacing	✓	
GPS	GPS Type	✗	
	GPS Port	✗	
	GPS Status	✓	
Video	Cameras	✓	

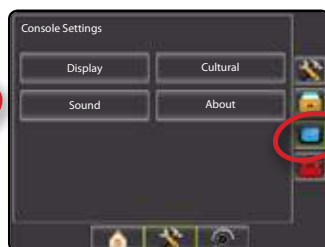
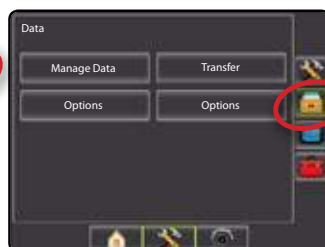
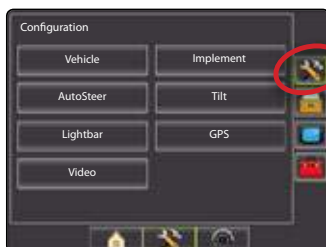
Data Management (page 61)		Job*
Manage Data	Duplicate	✗
	Delete Job Data	✗
Transfer	Export Job Data	✗
	Import Job Data	✗
	Delete Job Data	✗
Reports	Save PDF	✗
	Save KML	✗
	Save SHP	✗
	Save All Types	✗
Options	Job Mode	✗

Console Settings (page 70)		Job*
Display	Color Scheme	✗
	Brightness	✓
	Screenshot	✓
	Calibrate	✓
Cultural	Units	✓
	Language	✓
	Time Zone	✓
Sound	Volume	✓
About	System Information	✓
	Save System Info	✓

Tools (page 75)		Job*
Extras	Calculator	✓
	Units Converter	✓

✓ Available during an active job

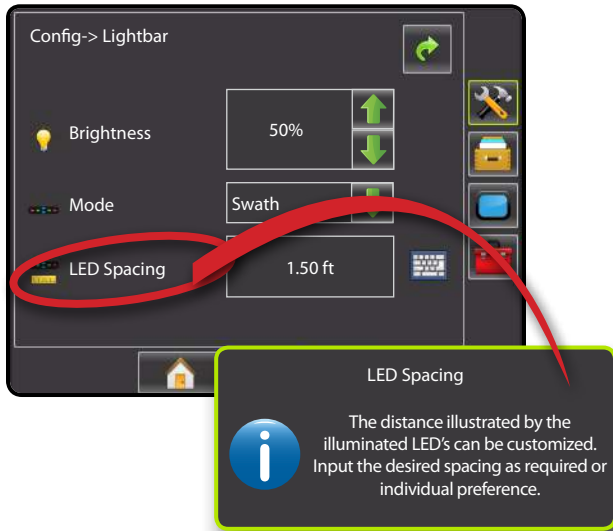
✗ Not Available during an active job



**Setup Option Information**

Press the option's icon or option's name of any menu item to display a definition and range values of that item. To remove the information box, press anywhere on the screen.

Figure 6-2: Example of Information Text Box



**Keyboard Entry Screen**

Press the KEYPAD icon to use a numeric keypad to enter a value. Press **Clear** to erase the existing value. Press the ACCEPT icon to save the settings or the CANCEL icon to leave the keypad without saving.

Figure 6-4: Example of Keyboard



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FULL SCREEN

**SETUP**

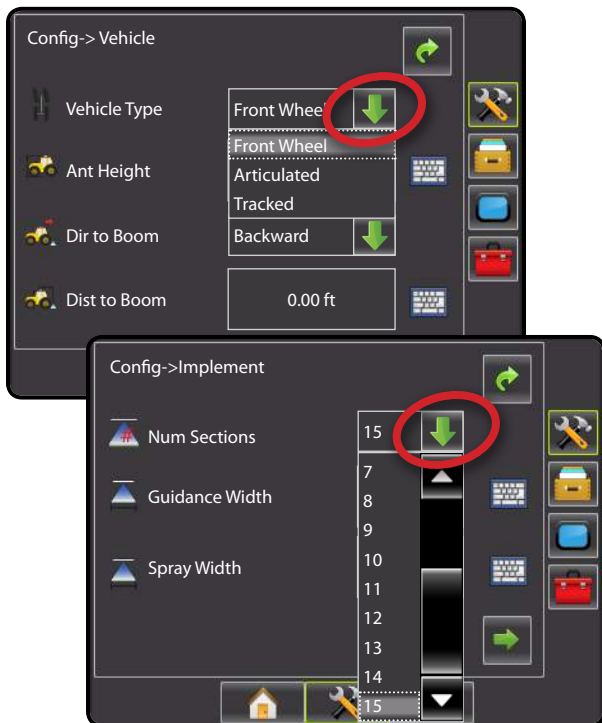
GUIDANCE

APPENDIX

**Drop Down Menu Selections**

Press DOWN arrow to access the options. Use the UP/DOWN arrows or slide bar if necessary to scroll through the extended list. Select the appropriate option. To close the list without selecting an option, tap anywhere on the screen outside the drop down menu.

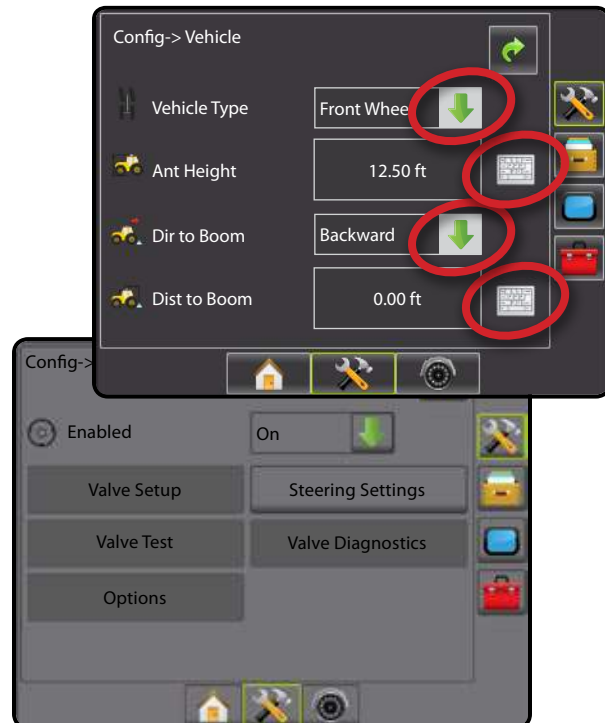
Figure 6-3: Example of Drop Down Menu



**Unavailable Options When Job is Active**



When a job is active some setup options are unavailable. See the Unit Setup Mode Availability Chart for indication of which options are not accessible.

Figure 6-5: Example of Unavailable Options



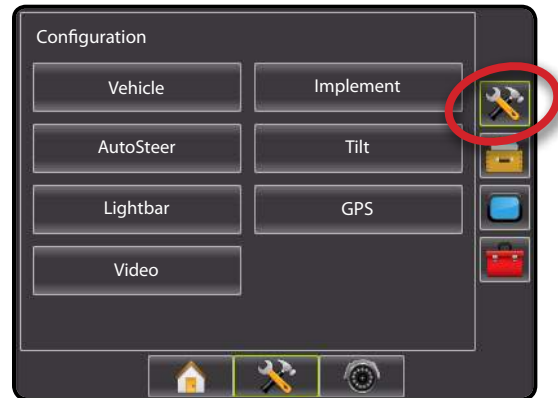
## CONFIGURATION

Configuration is used to configure the Vehicle, Implement, AutoSteer, Tilt, Lightbar, GPS and Video.

1. Press UNIT SETUP bottom tab .
2. Press CONFIGURATION side tab .
3. Select from:
  - ▶ Vehicle – used to establish vehicle type, antenna height, direction to boom and distance to boom
  - ▶ Implement – used to establish number of boom sections, guidance width, spray width, overlap percentage, implement delay on time and implement delay off time
  - ▶ AutoSteer – used to enable/disable assisted/auto steering as well as establish valve setup settings, steering settings and steering angle sensor settings; and perform valve tests and valve diagnostics
  - ▶ Tilt – used to enable/disable and calibrate the tilt function, allowing for tilt correction for application on hilly or sloped terrain








- ▶ Lightbar – used to establish LED brightness, LED mode and LED spacing
- ▶ GPS – used to establish the GPS type and port as well as to view GPS status information
- ▶ Video – used to set up individual cameras

Figure 6-6: Configuration Options



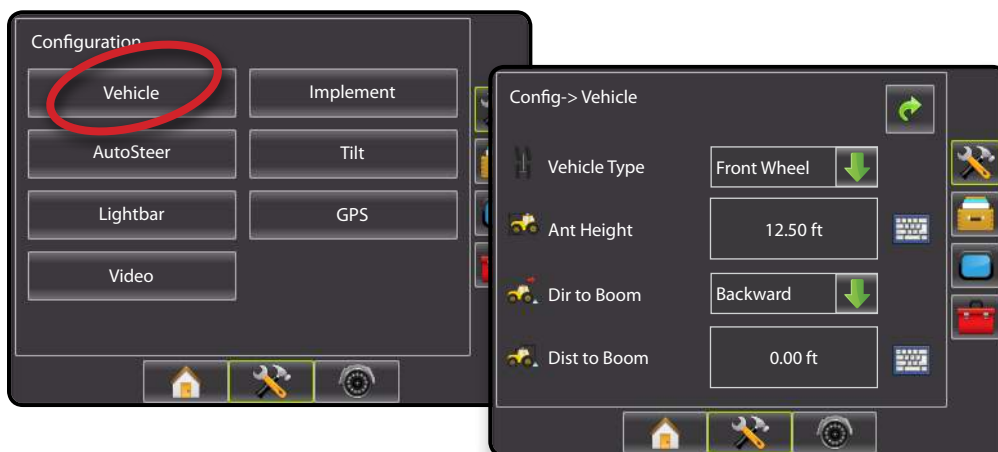
## Vehicle Setup

Vehicle Setup is used to configure Vehicle Type, Antenna Height, Direction to Boom and Distance to Boom.

1. Press CONFIGURATION side tab .
2. Press **Vehicle**.
3. Select from:
  - ▶ Vehicle Type  – used to select the type of vehicle steering that most closely represents your vehicle
  - ▶ Antenna Height  – used to enter the height of the antenna from the ground
  - ▶ Direction to Boom  – used to select whether the boom is located behind or in front of the GPS antenna
  - ▶ Distance to Boom  – used to enter the distance from the GPS antenna to the boom
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen

*NOTE: All settings under Vehicle Setup are required for autosteer and tilt sensor operation, as well as proper implement operation.*

Figure 6-7: Vehicle Setup Options



## Vehicle Type

Vehicle Type selects the type of vehicle steering that most closely represents your vehicle.


1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ Front wheel (also used for combines)
  - ▶ Articulated
  - ▶ Tracked

Figure 6-8: Vehicle Type



## Antenna Height

Antenna Height sets the height of the antenna from the ground. Range is 0.0 - 32.8 feet / 0.0 - 10.0 meters.

*NOTE: This setting is required for auto steering and tilt sensor operation.*

1. Press the KEYPAD icon .
2. Use the entry screen to establish the antenna height.

Figure 6-9: Antenna Height



## Direction to Boom

Direction to Boom sets whether the boom is located behind or in front of the GPS antenna as the vehicle moves in a forward direction.


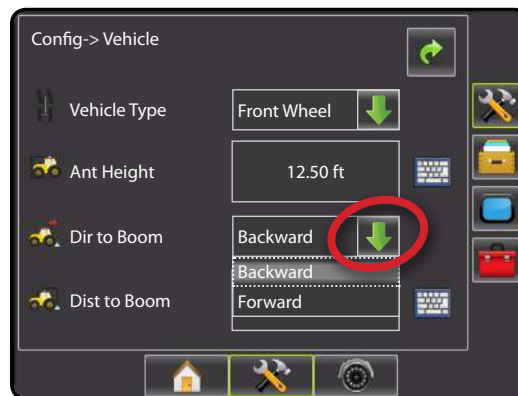
1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ Backward – indicates the boom is located behind the GPS antenna
  - ▶ Forward – indicates the boom is located in front of the GPS antenna

Figure 6-10: Direction to Boom



## Distance to Boom

Distance to Boom defines the distance from the GPS antenna to the boom. Range is 0.0 - 164.0 feet / 0.0 - 50.0 meters.


1. Press the KEYPAD icon .
2. Use the entry screen to establish the distance from the GPS antenna to the boom.

Figure 6-11: Distance to Boom



## Implement - Single Boom Setup

Implement Setup for a single boom is used to establish guidance width and spray width.

*Note: If a SmartCable or Section Driver Module (SDM) is present the configurations for Number of Boom Sections, Overlap, Delay On and Delay Off will be available. Please refer to the Implement - SmartCable or SDM section to view setup steps.*






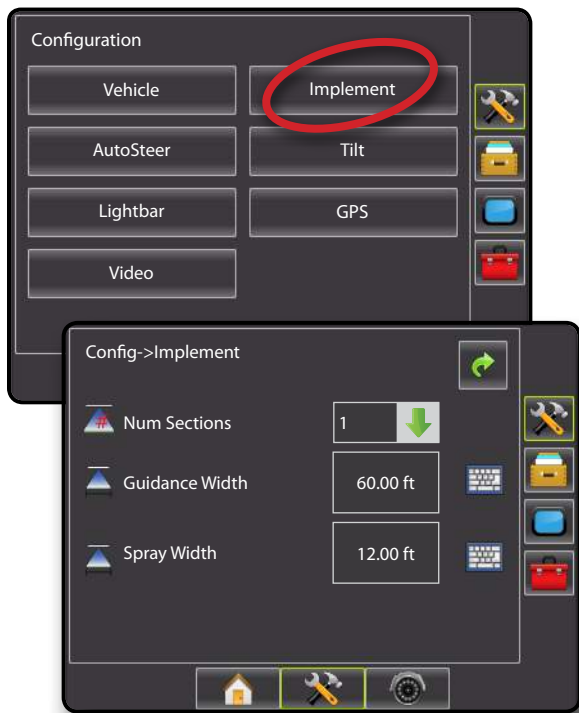
1. Press CONFIGURATION side tab .
2. Press **Implement**.
3. Select from:
  - ▶ Guidance Width  – used to enter the width between the guidelines
  - ▶ Spray Width  – used to enter the width of the implement
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 6-19: Implement Setup Options with No SDM



### Guidance Width

Guidance Width establishes the width between the guidelines. Range is 3.28 - 246.1 feet / 1.0 - 75.0 meters.

1. Press the KEYPAD icon .
2. Use the entry screen to establish the guidance width.


*NOTE: This setting is required for auto steering and tilt sensor operation.*

Figure 6-20: Guidance Width



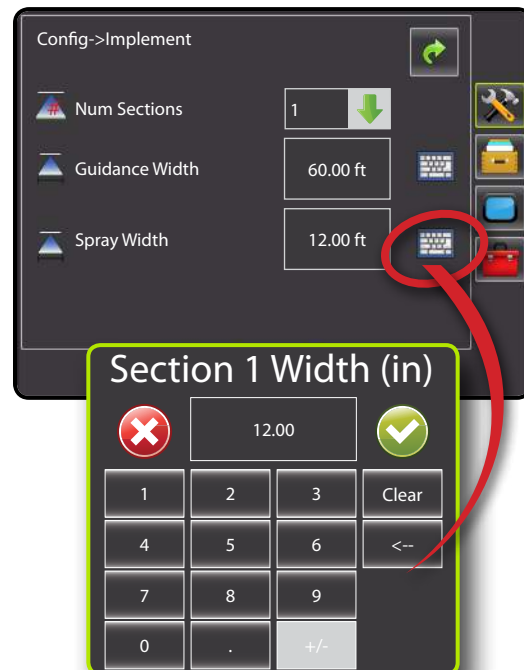
### Spray Width

Spray Width establishes the width of the implement. Range is 3.28 feet (39.3701 inches) - 246.06 feet (2952.76 inches) / 1.0 - 75.0 meters.

1. Press the KEYPAD icon .
2. Use the entry screen to establish the spray width.

*NOTE: This setting is required for auto steering and tilt sensor operation.*










Figure 6-21: Spray Width



## Implement - SmartCable or SDM

Implement Setup is used to establish number of boom sections, guidance width, spray width, overlap percentage, implement delay on time and implement delay off time.

*Note: If a SmartCable or Section Driver Module (SDM) is not present the configurations for Number of Boom Sections, Overlap, Delay On and Delay Off will not be available - only Guidance Width and Spray Width can be entered. Please refer to Single Boom Setup to view setup steps.*

1. Press CONFIGURATION side tab .
2. Press **Implement**.
3. Select from:
  - ▶ Number of Boom Sections  – used to select the number of available boom sections
  - ▶ Guidance Width  – used to enter the width between the guidelines
  - ▶ Spray Width  – used to enter the width of each implement section
  - ▶ Overlap  – used to select the amount of overlap allowed when the boom sections are turned on and off
  - ▶ Delay On  – used to enter the timing for the boom section valves to switch on
  - ▶ Delay Off  – used to enter the timing for the boom section valves to switch off
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.



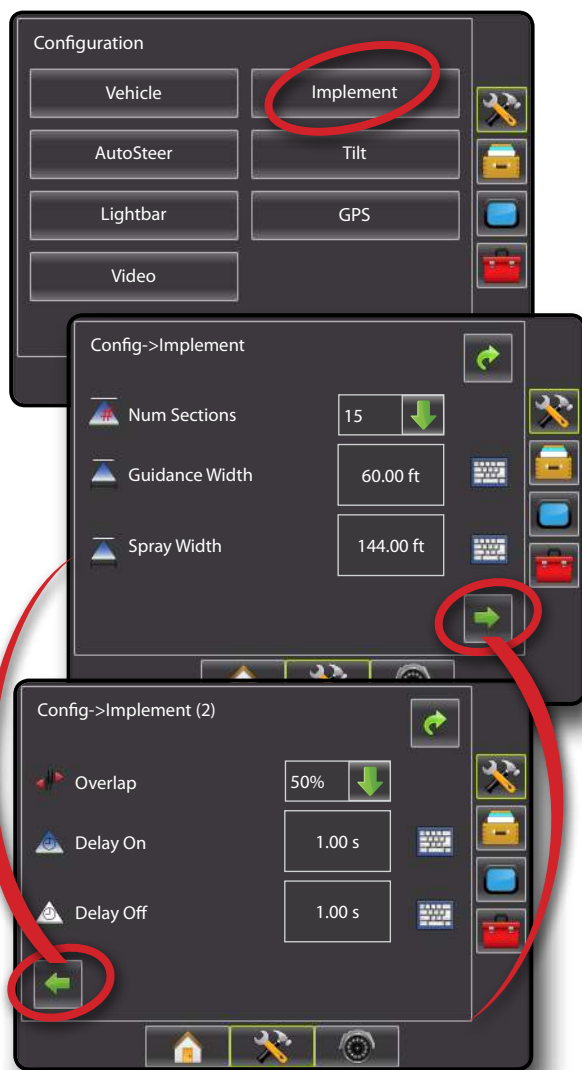
*NOTE: Press  or  to switch between Implement setup screens.*

Figure 6-12: Implement Setup Options with SmartCable or SDM



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### Number of Boom Sections

Number of Boom Sections establishes the number of available boom sections. If a SmartCable or Section Driver Module (SDM) is present, 1 to 6 or 1 to 15 section widths can be entered (depending on which SmartCable or Section Driver Module (SDM) is detected).


1. Press DOWN arrow  to access the list of options.
2. Select the number of boom sections on the implement:

Figure 6-13: Number of Boom Sections



### Guidance Width

Guidance Width establishes the width between the guidelines. Range is 3.28 - 246.1 feet / 1.0 - 75.0 meters.

*NOTE: This setting is required for auto steering operation.*


1. Press the KEYPAD icon .
2. Use the entry screen to establish the guidance width.



Figure 6-14: Guidance Width



### Spray Width

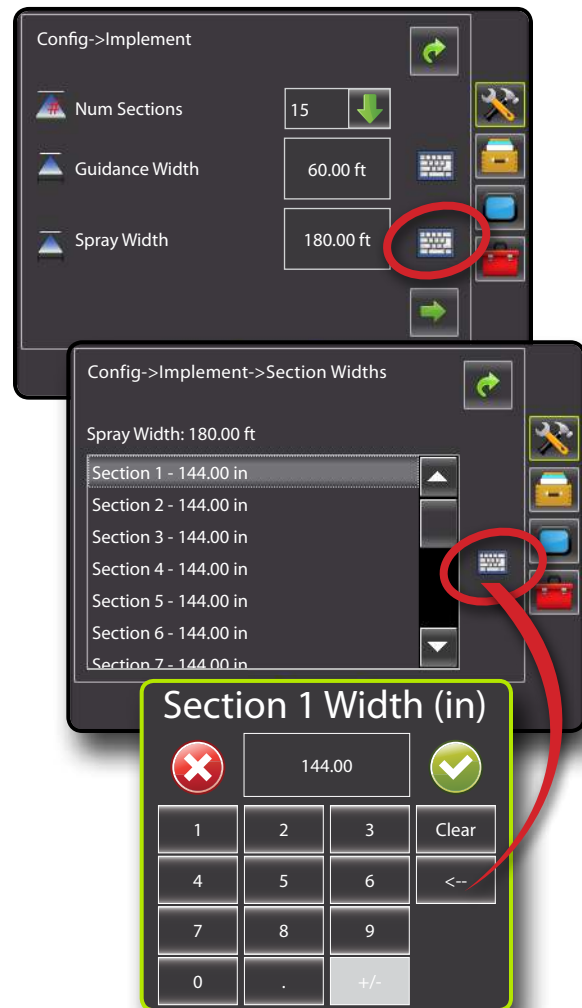
Spray width establishes the width of each implement section. When facing forward, boom sections are ordered from left to right along the boom. Spray width range is 3.28 - 246.1 feet / 1.0 - 75.0 meters. Boom section width range is 0.0 - 295.8 inches / 0.0 - 75.0 meters.

*NOTE: When entering a boom section width, the total of all sections must be greater than 3.28 feet (39.3701 inches) / 1.0 meter.*

1. Press the KEYPAD icon .
2. Highlight the section to be established.
3. Press the KEYPAD icon .
4. Use the entry screen to establish the spray width.
5. Repeat steps 2 to 4 until all sections have been established.

*NOTE: Individual boom sections can be set to different widths.*

Figure 6-15: Spray Width



## Overlap

Overlap determines the amount of overlap allowed when each boom section is turned on and off using Automatic Boom Section Control.


1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ 0%
  - ▶ 50%
  - ▶ 100%

Figure 6-16: Overlap

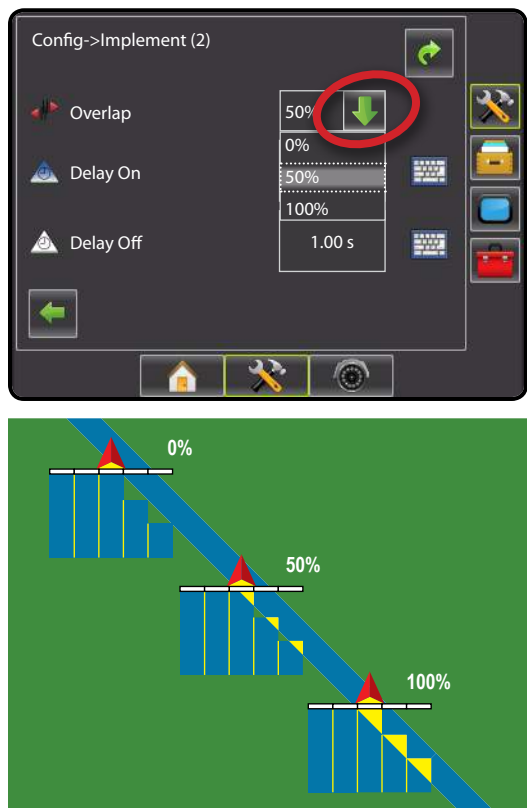
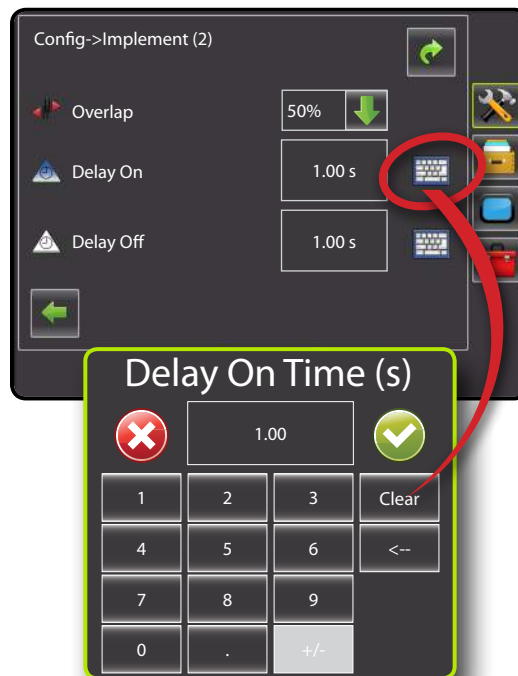


Figure 6-17: Delay On



## Delay Off

Delay Off functions as a “look ahead” for establishing the timing for the boom section valves to switch off exactly when entering an area that has been applied. If the boom turns off too soon when entering an applied area, decrease the Delay Off setting. If the boom turns off too late when entering an applied area, increase the Delay Off setting. Range is 0.0 - 10.0 seconds.


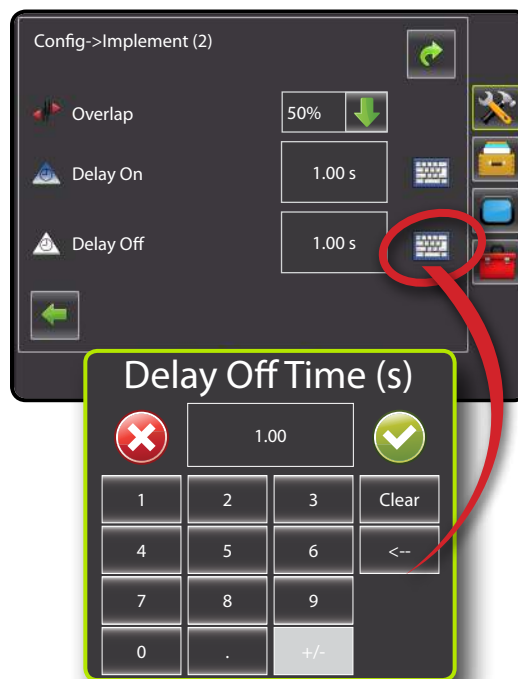

1. Press the KEYPAD icon .
2. Use the entry screen to establish the delay off time.

Figure 6-18: Delay Off



## Delay On

Delay On functions as a “look ahead” for establishing the timing for the boom section valves to switch on exactly when entering an area that has not been applied. If the boom turns on too soon when entering a non-applied area, decrease the Delay On setting. If the boom turns on too late when entering a non-applied area, increase the Delay On setting. Range is 0.0 - 10.0 seconds.

1. Press the KEYPAD icon .
2. Use the entry screen to establish the delay on time.

## AutoSteer

When a Steering Control Module (SCM) is present, Assisted/Auto Steering options will be available. For detailed setup instructions, refer to your specific assisted/auto steering installation manual.

**NOTE:** An update of your SCM software will also be required when updating an existing Matrix console to Matrix Pro.

AutoSteer setup is used to Enable/Disable Assisted/Auto Steering and configure Valve Setup, Steering Settings, Valve Test, Valve Diagnostics and Angle Sensor.




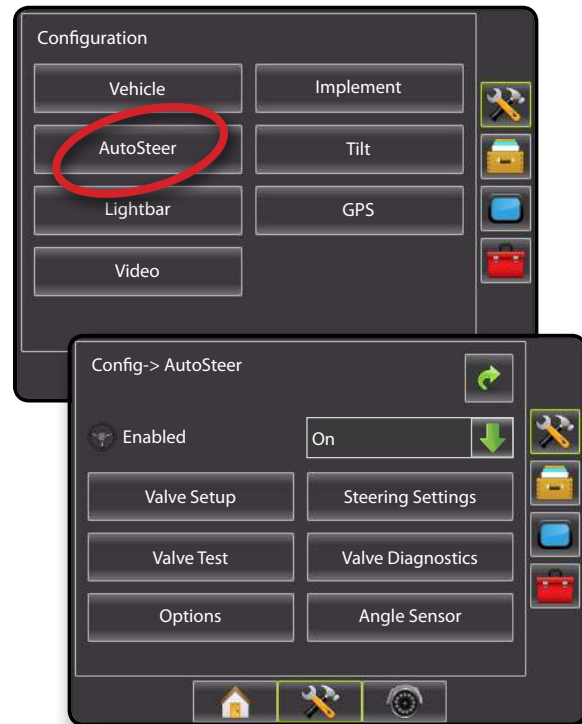
1. Press CONFIGURATION side tab .
2. Press **AutoSteer**.
3. Select if assisted/auto steering is
  - ▶ On – enabled
  - ▶ Off – disabled
4. Select from:
  - ▶ Valve Setup – used to configure Valve Type, Valve Frequency, Minimum Duty Cycle Left, Minimum Duty Cycle Right and Maximum Duty Cycle
  - ▶ Steering Settings – used to establish Coarse Adjustment, Fine Adjustment, Deadband and Lookahead
  - ▶ Valve Test – used to verify if steering is directed correctly
  - ▶ Valve Diagnostics – used to test the valves to see if they are connected properly
  - ▶ Options: Steering Wheel Sensor – used to select whether the steering disengage sensor is magnetic or pressure based
  - ▶ Angle Sensor – used to establish the Steering Angle Sensor (SAS) as the primary feedback sensor for auto steering, calibrate the SAS and set an offset adjustment.
5. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 6-22: AutoSteer



### Assisted/Auto Steering Unavailable

If an auto steering system is not installed, calibration options will not be available.

Figure 6-23: Auto Steering Not Detected



### 🚗 Enable/Disable Assisted/Auto Steering

Set assisted/auto steering to On or Off.


1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ On
  - ▶ Off

Figure 6-24: Enabled and Disabled Assisted/Auto Steering Options



If Enabled is set to "Off", all Assisted/Auto Steering capabilities and setup functions will be disabled (options will be grayed out).

Figure 6-25: Assisted/Auto Steering Off



### Valve Setup

Valve Setup is used to configure Valve Type, Valve Frequency, Minimum Duty Cycle Left, Minimum Duty Cycle Right and Maximum Duty Cycle.





1. Select **Valve Setup**.
2. Select from:
  - ▶ Valve Type  – used to select the type of steering valve
  - ▶ Frequency  – used to select the valve frequency used to drive the steering valve
  - ▶ Minimum Duty Cycle Left and Right  – used to set the minimum amount of drive required to begin steering the vehicle left or right
  - ▶ Maximum Duty Cycle  – used to select the maximum speed that the wheels will steer from lock to lock

Figure 6-26: Valve Setup



### 🔧 Valve Type

Valve type is used to set the type of steering valve.

*NOTE: See section "Verify Operation of Hydraulics and Set the Steering Control Rate" of your specific FieldPilot Installation Manual for your specific valve type.*


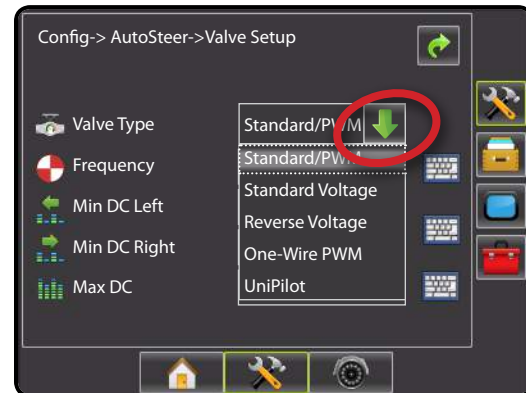
1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ Standard/PWM
  - ▶ Standard Voltage
  - ▶ Reversed Voltage
  - ▶ One-Wire PWM
  - ▶ UniPilot

Figure 6-27: Valve Type



## Valve Frequency

Valve frequency is used to drive the steering valve. The type of valve being used determines the frequency. Range is 0.9 - 15000.1.

*NOTE: See section “Verify Operation of Hydraulics and Set the Steering Control Rate” of your specific FieldPilot Installation Manual for your specific valve frequency.*


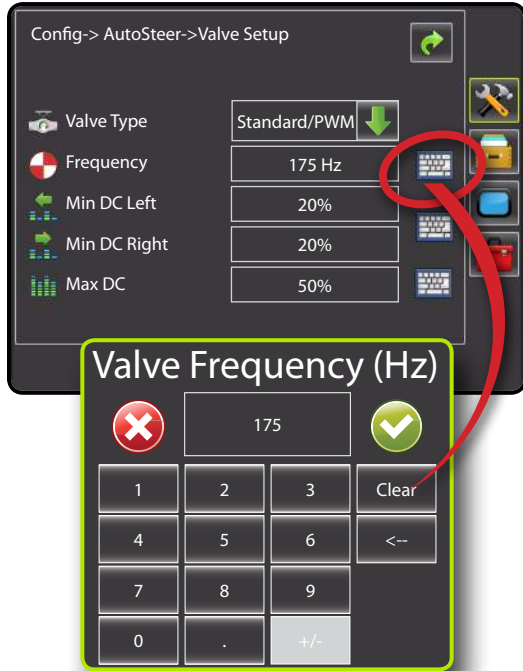
1. Press the KEYPAD icon .
2. Use the entry screen to establish the valve frequency.

Figure 6-28: Valve Frequency



The following are common frequencies/valves:

TeeJet Technologies		
Part #	Valve	Frequency
35-02151	FP, CC, NP	2 Hz
35-02152	FP, OC, HF, NP	2 Hz
35-02153	FP, OC, NP	2 Hz
35-02180	FP, CC, PWM 2.1	110 Hz
35-02181	FP, CC, PWM 1.1	110 Hz
35-02182	FP, OC, PWM 4.0	175 Hz
35-02183	FP, OC, PWM 1.1	110 Hz
35-02184	FP, OC, PWM 7.9	175 Hz
35-02185	FP, OC, PWM 2.1	110 Hz
35-02186	FP, CC, PWM 4.0	110 Hz
35-02187	FP, CC, PWM 7.9	175 Hz
35-02189	FP, OC, PWM 3.2	110 Hz
35-02192	FP, CC, PWM 1.1, Master	110 Hz
35-02193	FP, CC, PWM 2.1, Master	110 Hz

### TeeJet Technologies

Part #	Valve	Frequency
35-02194	FP, CC, PWM 3.2, Master	110 Hz
35-02195	FP, CC, PWM 4.0, Master	175 Hz
35-02196	FP, CC, PWM 7.9, Master	175 Hz

FP = FieldPilot, HF = High Flow, CC = Closed Center, OC = Open Center, NP = Non-Proportional

For valves manufactured by sources other than TeeJet Technologies, please refer to manufacturer's specifications for appropriate valve frequency.

### Minimum/Maximum Duty Cycle Tests

Minimum Duty Cycle (Minimum DC Left + Right) sets the minimum amount of drive required to begin steering the vehicle left or right. Range is 0.0 - 50.0.

Maximum Duty Cycle sets the maximum speed that the wheels will steer from left to right / right to left (lock to lock). Range is 25 - 100.

*NOTE: A GPS signal is required for these tests.*

*Machine must be at normal operation RPM.*

*RECOMMENDATION: Have a large area of clear space available to perform test cycles. Vehicle speed must be between 1.0 mph and 8.0 mph / 1.5 - 13.0 km/h (0.4 - 3.6 m/s).*

**WARNING: Pinch Point Hazard!**

*To prevent serious injury or death, avoid unsafe practice while manually operating hydraulic steering circuits. Keep others away and stay clear of mechanical linkage.*

### Minimum Duty Cycle Left Test

Minimum Duty Cycle Left sets the minimum amount of drive required to begin steering the vehicle to the left.

*NOTE: If the valve frequency is set below 15 Hz (non proportional), set the amount of drive to “25.0”. Cycle test is not necessary.*



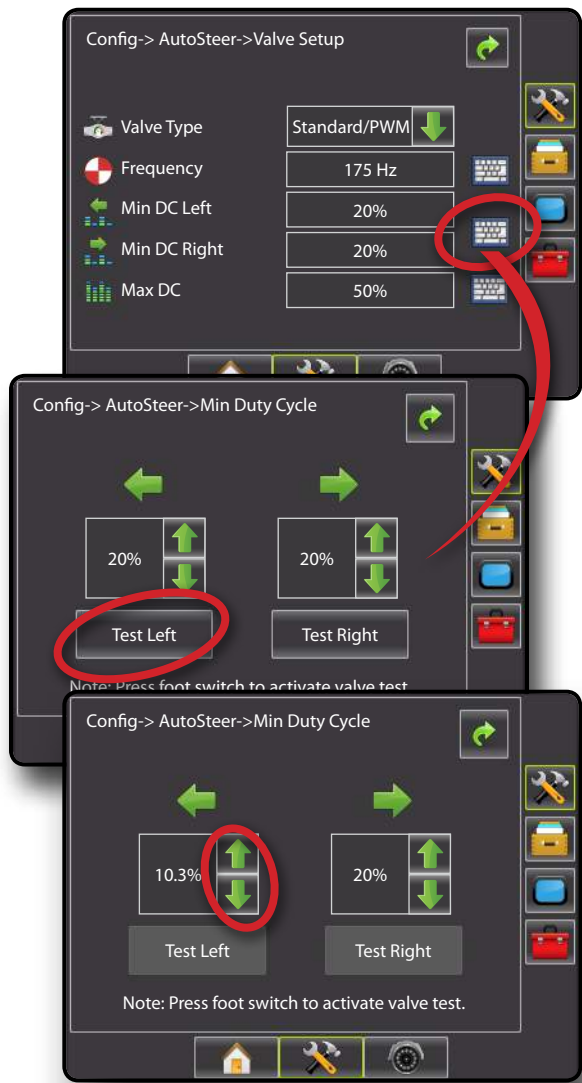
1. Press the KEYPAD icon .
2. While the vehicle is moving in a slow forward straight line motion between 1.0 mph and 8.0 mph / 1.5 - 13.0 km/h (0.4 - 3.6 m/s), press **Test Left**.
3. Press the engage/disengage switch or foot switch to activate the test.
4. Slowly increase the duty cycle number using the UP arrow  until the vehicle begins to turn left.
5. Turn the steering wheel or press the engage/disengage switch or foot switch to complete the test.

Figure 6-29: Minimum Duty Cycle Test



## Minimum Duty Cycle Right Test

Minimum Duty Cycle Right sets the minimum amount of drive required to begin steering the vehicle to the right.

*NOTE: If the valve frequency is set below 15 Hz (non proportional), set the amount of drive to "25.0". Cycle test is not necessary.*



1. Press the KEYPAD icon .
2. While the vehicle is moving in a slow forward straight line motion between 1.0 mph and 8.0 mph / 1.5 - 13.0 km/h (0.4 - 3.6 m/s), press **Test Right**.
3. Press the engage/disengage switch or foot switch to activate the test.
4. Slowly increase the duty cycle number using the UP arrow  until the vehicle begins to turn right.
5. Turn the steering wheel or press the engage/disengage switch or foot switch to complete the test.

Figure 6-30: Minimum Duty Cycle Test






## Maximum Duty Cycle Test

Maximum Duty Cycle sets the maximum speed that the wheels will steer from lock to lock.

**NOTE:** If the valve frequency is below 15 Hz (non proportional), set the value to 100. Speed will be established during the Valve Test.

**NOTE:** See section “Verify Operation of Hydraulics and Set the Steering Control Rate” of your specific FieldPilot Installation Manual for your specific lock to lock time.

1. Press the KEYPAD icon .
2. While the vehicle is moving in a slow forward motion between 1.0 mph and 8.0 mph / 1.5 - 13.0 km/h (0.4 - 3.6 m/s), turn the wheels all the way to the left (or right).
3. Press the RIGHT arrow  (or LEFT arrow .
4. Press the engage/disengage switch or foot switch to activate the test. This will start a timer as well as turn the vehicle to the right (or left).

**WARNING!** When using a UniPilot, the UniPilot will move the steering wheel very quickly. Keep loose clothing, hair and hands away from the steering wheel while performing this test.



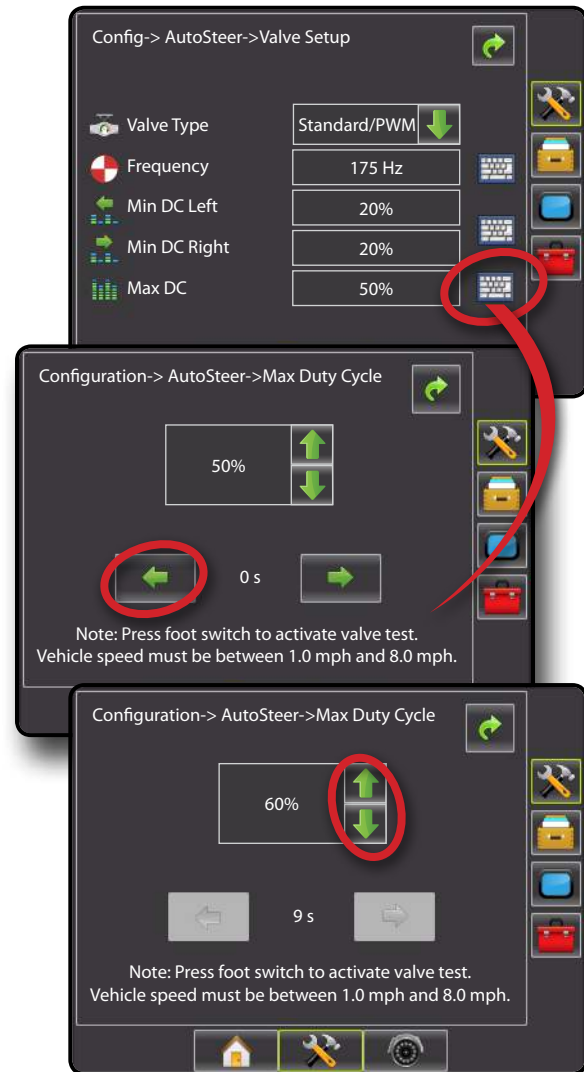
5. When the wheels are all the way to the right (or left), stop the test by pressing the engage/disengage switch or foot switch. The time displayed is the lock to lock time.
6. Repeat to perform procedure to the opposite side.
7. Compare the lock-to-lock time with the recommended time.
8. Press the UP/DOWN arrows   to adjust the value.
  - ▶ Lock-to-lock time is too low (turning too fast) – decrease the value
  - ▶ Lock to lock time is too high (turning too slow) – increase the value
9. Repeat until recommended lock time is achieved.

Figure 6-31: Calibrate Maximum Duty Cycle



## Steering Settings

Steering Settings is used to configure Coarse Adjustment, Fine Adjustment, Deadband and Lookahead settings.

1. Select **Steering Settings**.
2. Select from:
  - ▶ Coarse Adjustment – used to select how aggressively the vehicle maintains a guideline in Straight AB Guidance
  - ▶ Fine Adjustment – used to select how aggressively the vehicle maintains a guideline in Curved AB Guidance
  - ▶ Deadband – used to set if steering is too choppy/ responsive or remains consistently off the guideline
  - ▶ Lookahead – used to select the vehicle’s approach to the guideline in Straight AB Guidance mode

Figure 6-32: Steering Settings

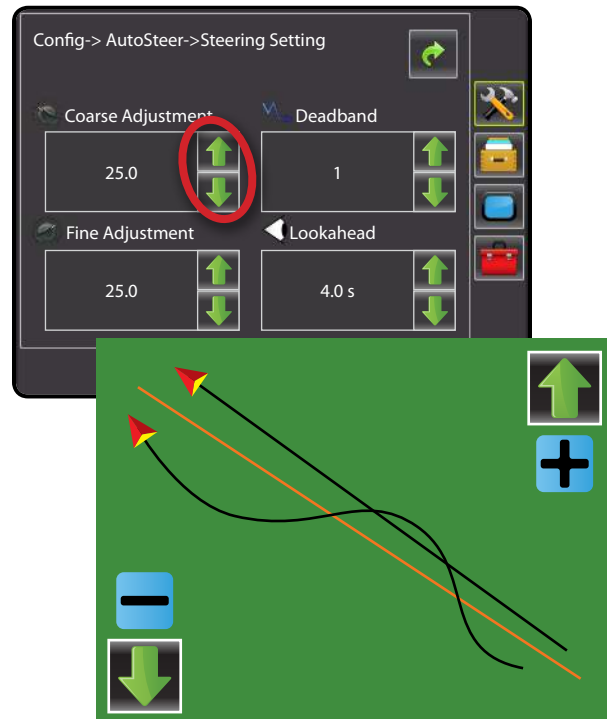


### Coarse Steering Adjustment

Coarse Steering Adjustment adjusts how aggressively the vehicle maintains a guideline in Straight AB Guidance mode. Range is 0.0 - 100.0.

1. Press:
  - ▶ UP arrow if the vehicle is drifting away from the guideline or not approaching it fast enough
  - ▶ DOWN arrow if the vehicle is oscillating rapidly or overshooting the guideline

Figure 6-33: Coarse Steering Adjustment

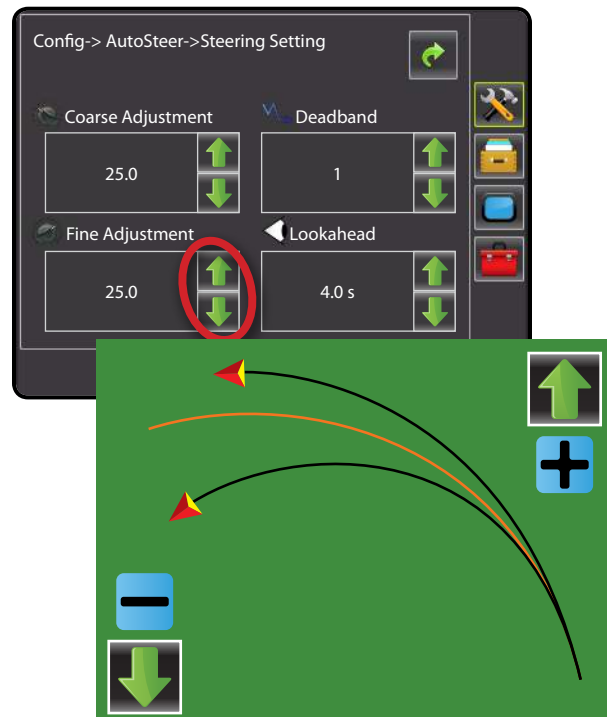


### Fine Steering Adjustment

Fine Steering Adjustment adjusts how aggressively the vehicle maintains a guideline in Curved AB Guidance mode. Range is 0.0 - 100.0.

1. Press:
  - ▶ UP arrow if the vehicle drives outside of corners
  - ▶ DOWN arrow if the vehicle cuts corners

Figure 6-34: Fine Steering Adjustment



### Deadband

Deadband adjusts if steering is too choppy/responsive or remains consistently off the guideline. As the value is increased, stability will increase but so will steady state error. Range is 1 - 10. Default is 1.



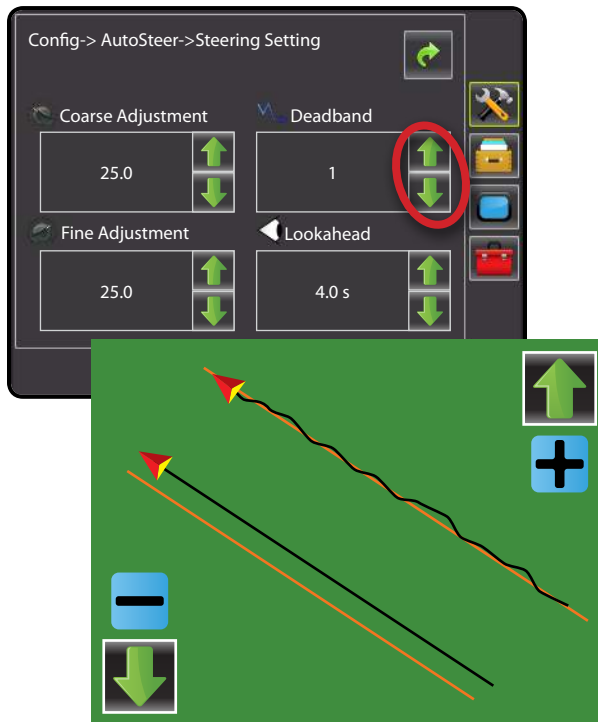
- Press:
  - ▶ UP arrow  if steering is too choppy or too responsive.
  - ▶ DOWN arrow  if the vehicle remains consistently off the guideline.

Figure 6-35: Deadband



### Lookahead

Lookahead used during Straight AB Guidance mode to adjust the vehicle's approach to the guideline. Fine tune the Lookahead by conducting several approaches to the guideline. Range is 0.0 - 10.0 seconds. Default is 4.0 seconds.



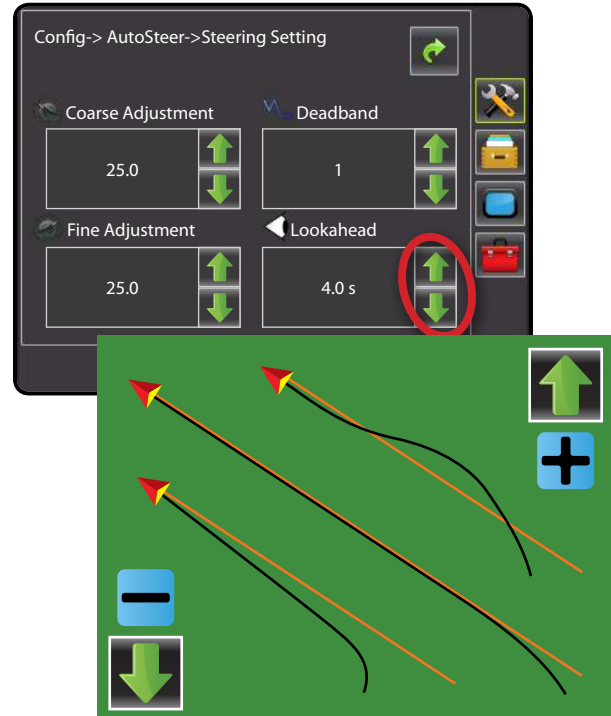
- Press:
  - ▶ UP arrow  if the vehicle is overshooting the guideline when approaching.
  - ▶ DOWN arrow  if the vehicle takes too long to get to the guideline.

Figure 6-36: Lookahead




### Valve Test

The Valve Test verifies if steering is directed correctly. It can also be used to test the amount of time to steer the wheels from full left to full right (lock to lock) for non-proportional valves.

For non-proportional valves, the amount of time for left-to-right or right-to-left (lock to lock) will be established by mechanically adjusting oil flow through the valve.

For a UniPilot ESM, the amount of time for left-to-right or right-to-left (lock to lock) will be established by adjusting the Max Duty Cycle value.

*NOTE: See section "Verify Operation of Hydraulics and Set the Steering Control Rate" of your specific FieldPilot Installation Manual for your specific lock to lock time.*

- Select **Valve Test**.
- While the vehicle is moving in a slow forward motion, turn the wheels all the way to the left.
- Press RIGHT arrow .
- Press the engage/disengage switch or foot switch to activate the test. This will start a timer as well as turn the vehicle to the right.

**WARNING!** When using a UniPilot, the UniPilot will move the steering wheel very quickly. Keep loose clothing, hair and hands away from the steering wheel while performing this test.

- Press the engage/disengage switch or foot switch when the wheels are all the way to the right. The time displayed is the lock to lock time.

6. While the vehicle is moving in a slow forward motion, turn the wheels all the way to the right.
7. Press LEFT arrow ←.
8. Press the engage/disengage switch or foot switch to activate the test. This will start a timer as well as turn the vehicle to the left.

**WARNING!** When using a UniPilot, the UniPilot will move the steering wheel very quickly. Keep loose clothing, hair and hands away from the steering wheel while performing this test.

9. Press the engage/disengage switch or foot switch when the wheels are all the way to the right. The time displayed is the lock to lock time.
10. Compare the lock-to-lock time with the recommended time.
11. Adjust the valve oil flow as needed and repeat test as needed.

Figure 6-37: Valve Test



## Valve Diagnostics

The valve diagnostic test verifies if the valve is operating correctly.

This test is not necessary for UniPilot.

*NOTE: The diagnostic tests do not require that the vehicle is in motion. A valid GPS signal is not required.*

Figure 6-38: Valve Diagnostics



### Steering Valve – No Master Solenoid

1. Select **Valve Diagnostics**.
2. Activate the **Left** or **Right** check boxes associated with the valve direction to be tested.
3. Press and hold the engage/disengage switch or foot switch for one second.

NOTE: Do not activate the **Master** check box.

#### Test Reactions

Selected			Reaction	Issue
Left	Master	Right		
			None	Valve is operating correctly
			Wheels turn	Either the left valve or right valve is stuck open
•			Vehicle turns left	Valve is operating correctly
•			None	SCM, harness or valve malfunction
•			Vehicle turns right	Left and right connections to valve are reversed
		•	Vehicle turns right	Valve is operating correctly
		•	None	SCM, harness or valve malfunction
		•	Vehicle turns left	Left and right connections to valve are reversed

### Steering Valve – With Master Solenoid

1. Select **Valve Diagnostics**.
2. Activate the **Master** check box.
3. Activate the **Left** or **Right** check boxes associated with the valve direction to be tested.
4. Press and hold the engage/disengage switch or foot switch for one second.

#### Test Reactions

Selected			Reaction	Issue
Left	Master	Right		
	•		None	Valve is operating correctly
	•		Wheels turn	Either the left valve or right valve is stuck open
•			None	Valve is operating correctly
•			Wheels turn	Master valve is stuck open
		•	None	Valve is operating correctly
		•	Wheels turn	Master valve is stuck open
•	•		Vehicle turns left	Valve is operating correctly
•	•		Vehicle turns right	Left and right connections to valve are reversed
•	•		None	SCM, harness or valve malfunction
	•	•	Vehicle turns right	Valve is operating correctly
	•	•	Vehicle turns left	Left and right connections to valve are reversed
	•	•	None	SCM, harness or valve malfunction

### Options: Steering Wheel Sensor

Steering wheel sensor selects whether the sensor used to automatically disengage FieldPilot is magnetic or pressure based when the steering wheel is turned. Check your specific configuration to determine if a Steering Wheel Switch Kit or a Pressure Sensor is being used.

The UniPilot is not affected by this setting.


1. Select **Options**.
2. Press DOWN arrow  to access the list of options.
3. Select:
  - ▶ Magnetic
  - ▶ Pressure

Figure 6-39: Options: Steering Wheel Sensor



### Angle Sensor

Angle Sensor is used to establish the Steering Angle Sensor (SAS) as the primary feedback sensor for auto steering, calibrate the SAS and set an offset adjustment.


1. Select **Angle Sensor**.
2. Select if the angle sensor is
  - ▶ Enabled
  - ▶ Disabled.
3. Select from:
  - ▶ Calibrate Sensor – sets the turn rate when steering the vehicle left and right.
  - ▶ Offset Adjustment – adjusts the path of travel to the established guideline.

Figure 6-40: Steering Angle Sensor



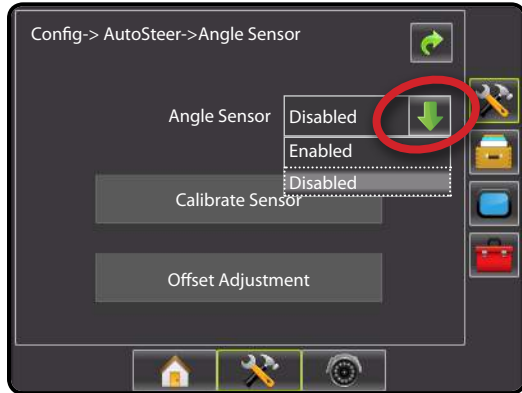
### Enable/Disable Angle Sensor

Set the use of a steering angle sensor to enabled or disabled.

1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ Enabled
  - ▶ Disabled

If Angle Sensor is set to “Disabled”, all Angle Sensor capabilities and setup functions will be disabled (options will be grayed out).

Figure 6-41: Enabled and Disabled Assisted/Auto Steering Options



### Calibrate Sensor

Calibrate Sensor sets the turn rate when steering the vehicle left and right.

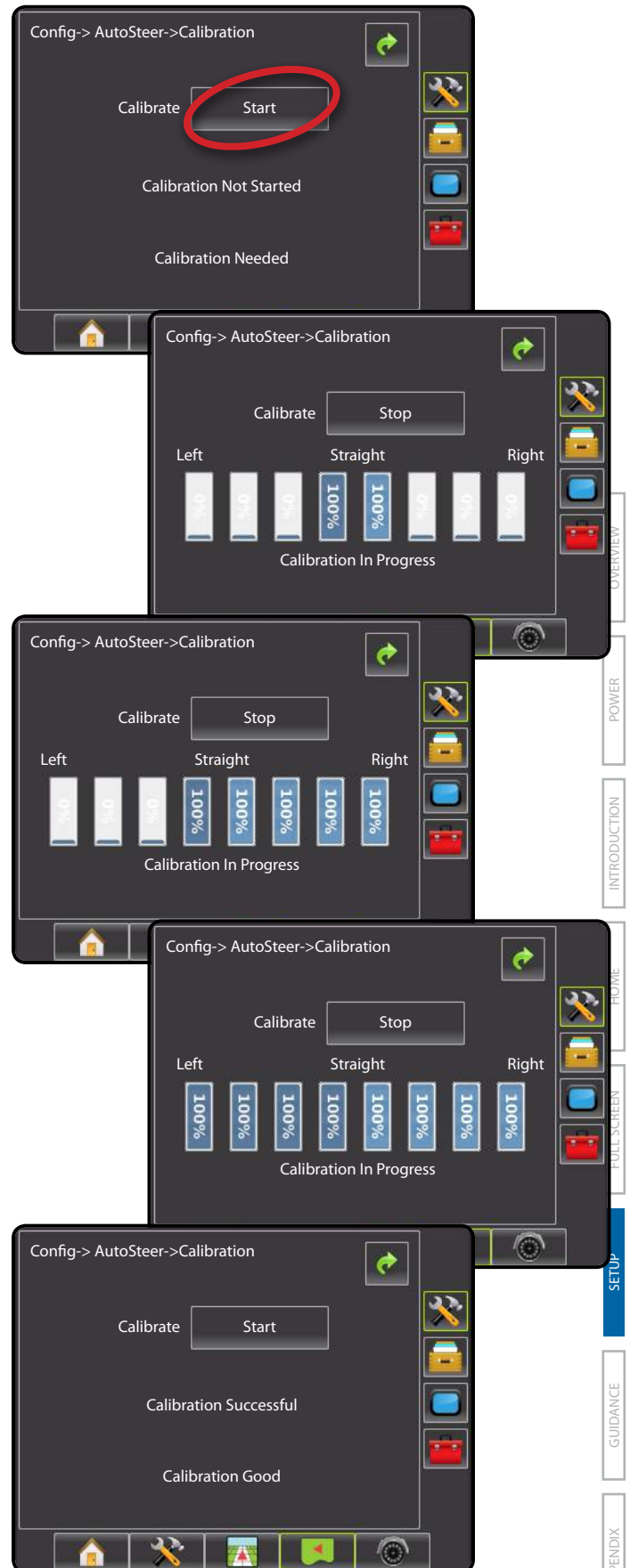
*NOTE: A GPS signal is required for this test.*

*RECOMMENDATION: Have a large area of clear space available to perform test cycles. Vehicle speed must be between 1.0 mph and 8.0 mph / 1.5 - 13.0 km/hr (0.4 - 3.6 m/s).*

1. Select **Calibrate Sensor**.
2. Slowly move the vehicle in a slow forward motion so the center two calibration boxes fill to 100%.
3. While still moving, slowly turn to the right or left until the appropriate right or left calibration boxes are filled to 100%.
4. While still moving, slowly turn in the opposite direction until the appropriate left or right calibration boxes are filled to 100%
5. “Calibration Successful” will appear when both left and right calibrations have been completed.

Press **Stop** to cancel the calibration.

Figure 6-42: Calibrate Sensor



OVERVIEW  
POWER  
INTRODUCTION  
HOME  
FULL SCREEN  
SETUP  
GUIDANCE  
APPENDIX

## Offset Adjustment

Offset Adjustment adjusts the path of travel to the established guideline.

*NOTE: A GPS signal is required for this test.*

*RECOMMENDATION: Have a large area of clear space available to perform a test cycle. Typical operating speed must be maintained for at least 30 seconds.*

1. Establish and/or activate a Straight AB guideline.
2. Select **Offset Adjustment**.
3. Engage assisted/auto steering guidance on established straight AB guideline.
4. While the vehicle is moving in a slow forward straight line motion at typical operating speed on the established guideline, press **Start**.
5. Allow the vehicle to drive using the Assisted/Auto Steering for 30 seconds
6. "Adjust Successful" will appear when adjustment has been completed.

Press **Stop** to cancel the adjustment.





Figure 6-43: Offset Adjustment



## Tilt

The Tilt function corrects the GPS signal to compensate for errors in the GPS position while operating on sloped terrain.

*NOTE: A mistake in the calibration process that results in a 1 degree error in the Tilt reading from the SCM/TGM will result in a 2.0 in. / 5.1 cm error in guidance [on a machine that has 9.5 ft. / 2.9 m antenna height]. This potential error necessitates that all reasonable care is taken to ensure that the system is installed and calibrated correctly in order to produce accurate Tilt measurement and machine guidance.*

1. Press CONFIGURATION side tab .
2. Press **Tilt**.
3. Select from:
  - ▶ Enabled  – used to set tilt correction to on or off
  - ▶ Field Level – used to calibrate tilt correction
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

*NOTE: If FieldPilot or UniPilot is being used, tilt correction is built into the SCM.*

*NOTE: Antenna Height must be entered prior to Tilt Calibration.*

Figure 6-44: Tilt




### Tilt Correction Unavailable

If a TGM or SCM is not connected or the vehicle is in motion, calibration option will not be available. Vehicle must be stopped for at least 10 seconds to begin to calibrate tilt correction.

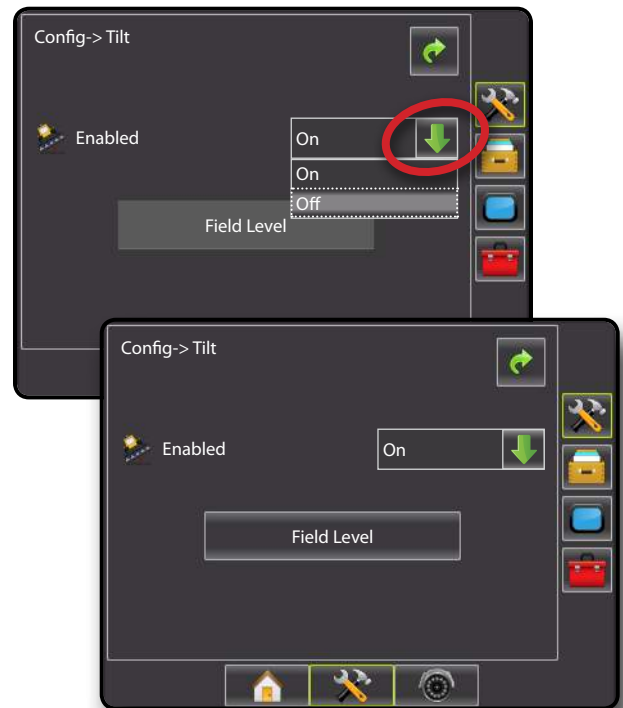
### Enable/Disable Tilt

Set Tilt option to on or off.

1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ On
  - ▶ Off

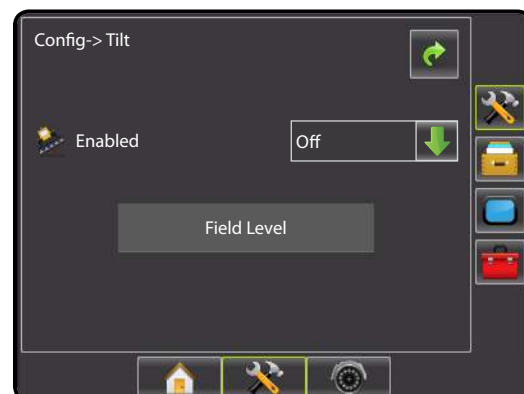
*NOTE: When tilt is enabled and the vehicle is in motion, **Field Level** will not be available. Vehicle must be stopped for at least 10 seconds to begin to calibrate tilt correction.*

Figure 6-45: Tilt On/Off



If Enabled is set to "Off", field leveling capabilities will be disabled (option will be grayed out).

Figure 6-46: Tilt Correction Off



### Field Level

Field level will calibrate the SCM/TGM's level surface value.

Before performing Field Level:

- Use a quality GPS receiver/antenna
- Make sure the GPS antenna is mounted as per the manufacturer's installation instructions
- The SCM/TGM **must be securely mounted** to a surface that moves in parallel to the surface that the GPS antenna is mounted on. For example, if the antenna is mounted to the roof of the cab, the SCM/TGM should be mounted to another surface on the cab, not on the chassis.
- Mount the SCM/TGM on a horizontal surface with the connectors facing straight up and the arrow on the decal pointing in the primary direction of travel.
- Choose a calibration site that is as level as possible

To calibrate the SCM/TGM:

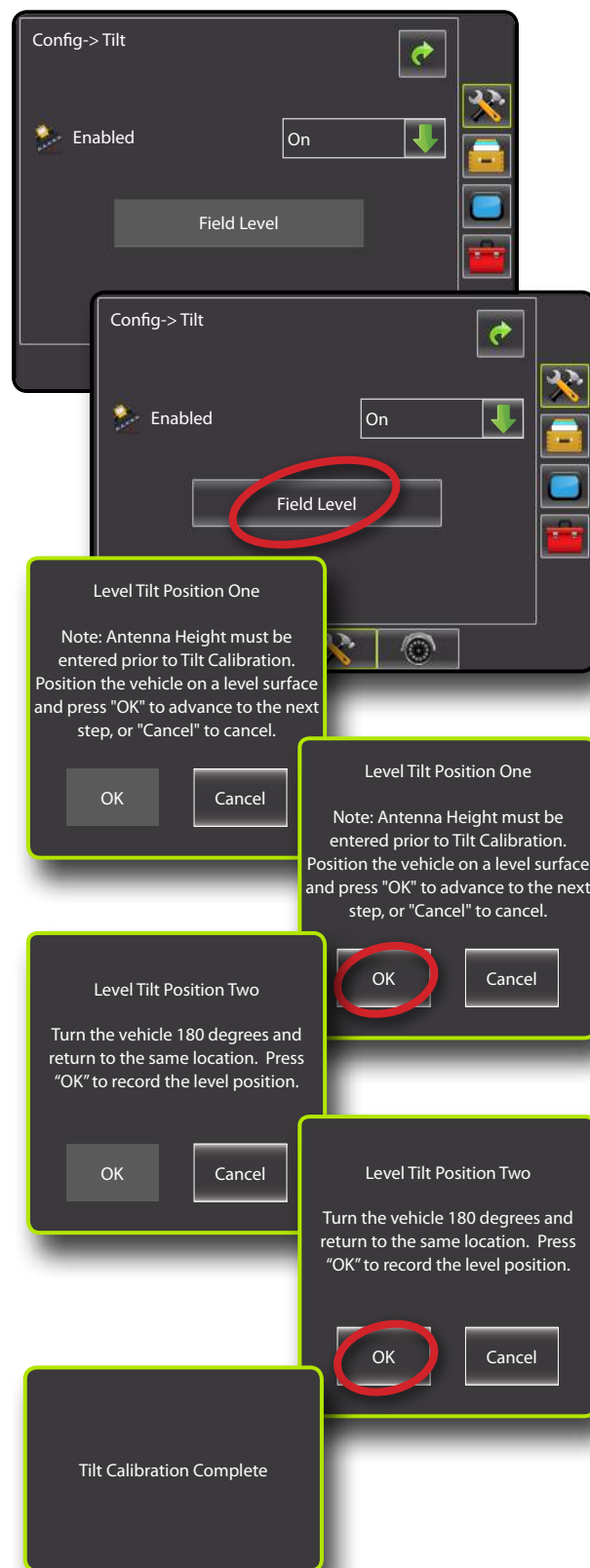
1. Position the vehicle on a level surface. Let vehicle sit/settle for at least 10 seconds.
2. Select **Field Level**.
3. Let vehicle sit/settle for at least 10 seconds.
4. Press **OK**.

*NOTE: Until vehicle has been stopped for at least 10 seconds, **OK** will not be available.*

5. Get out of the vehicle to mark on the ground the exact position of the vehicle (use paint, sticks, or something similar).
6. Turn the vehicle 180 degrees and reposition the vehicle in exactly the same location (the front wheels should now be where the back wheels were, and the back wheels should be where the front wheels were).
7. Let vehicle sit/settle for at least 10 seconds.
8. Press **OK**.

*NOTE: Until vehicle has been stopped for at least 10 seconds, **OK** will not be available.*

Figure 6-47: Field Level



## Lightbar

Lightbar Setup is used to configure LED Brightness, Display/Swath Mode and LED Spacing.







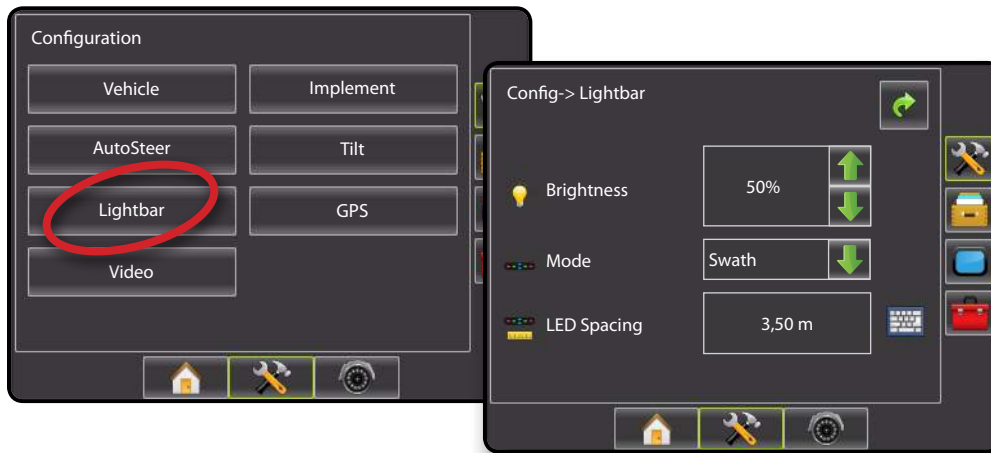
1. Press CONFIGURATION side tab .
  2. Press **Lightbar**.
  3. Select from:
    - ▶ Brightness  – used to select the brightness of the lightbar LEDs
    - ▶ Display Mode  – used to select whether the lightbar represents the swath or vehicle
    - ▶ LED Spacing  – used to set the distance illustrated by the illuminated LEDs
- Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 6-48: Lightbar



### LED Brightness

LED Brightness adjusts the brightness of the lightbar LEDs. Range is 0 - 100.



1. Press:
  - ▶ UP arrow  to brighten the LEDs
  - ▶ DOWN arrow  to darken the LEDs

Figure 6-49: LED Brightness



**Display Mode**

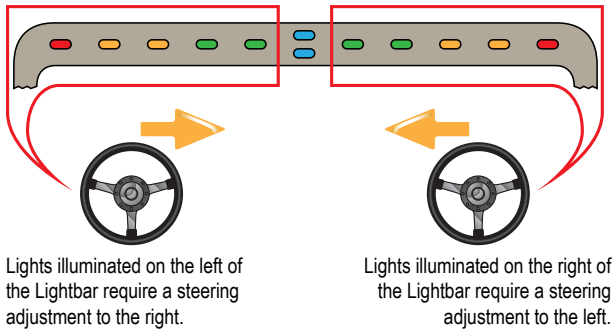
Display mode determines whether the lightbar represents the swath or vehicle.

1. Press DOWN arrow ↓ to access the list of options.
2. Select:
  - ▶ Swath – the LEDs represent the guideline location and the moving LED represents the vehicle
  - ▶ Vehicle – the center LED represents vehicle location and the moving LED represents the guideline

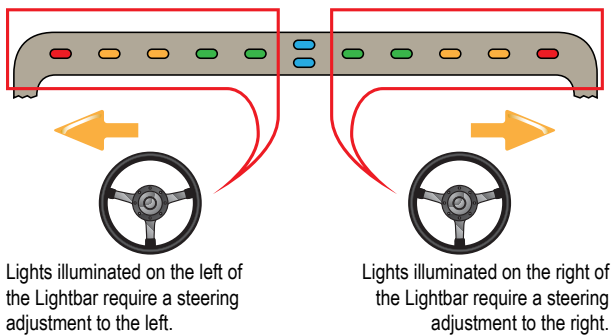
Figure 6-50: Display Mode



Figure 6-51: Swath Lightbar



**Vehicle Lightbar**

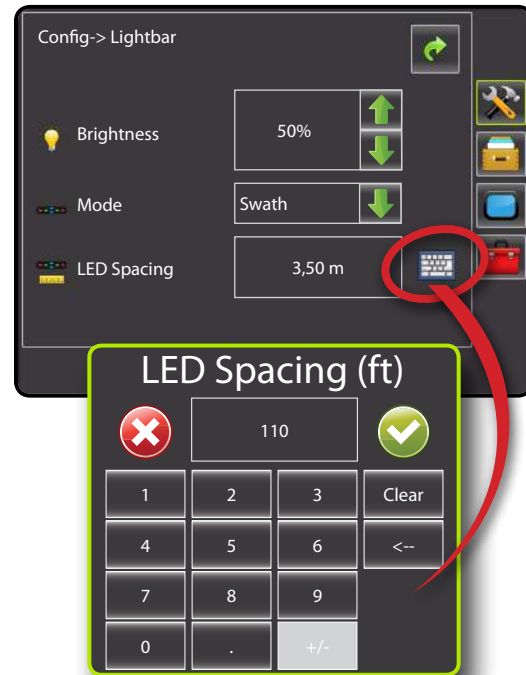


**LED Spacing**

LED Spacing sets the distance illustrated by the illuminated LEDs. Range is 0.04 - 9.8 feet / 0.01 - 3.0 meters. Recommended distance is 1.5 feet / 0.3 meter.

1. Press the KEYPAD icon.
2. Use the entry screen to establish the distance.

Figure 6-52: LED Spacing



## GPS

GPS is used to configure GPS Type and GPS Port.

*NOTE: These settings are required for assisted/auto steering and tilt sensor operation, as well as proper implement operation.*







1. Press CONFIGURATION side tab .
2. Press **GPS**.
3. Select from:
  - ▶ GPS Type  – select GPS source transmissions
  - ▶ GPS Port  – sets (D)GPS COM port
  - ▶ GPS Status  – displays information for TeeJet Customer Service use on GGA/VTG (Data Rates), Number of Satellites, HDOP, PRN, GGA Quality, GPS Receiver and Receiver Version
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 6-53: GPS



## GPS Type

GPS Type customizes the system to accept GPS source or DGPS source transmissions. GLONASS is only available with a compatible receiver.


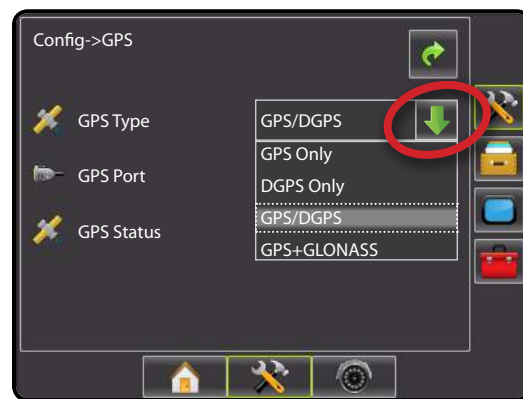

1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ GPS Only – uncorrected signals
  - ▶ DGPS Only – differentially corrected signals
  - ▶ GPS/DGPS – either type of signal
  - ▶ GPS+GLONASS – uncorrected signals from both the GPS and GLONASS systems

Figure 6-54: GPS Type



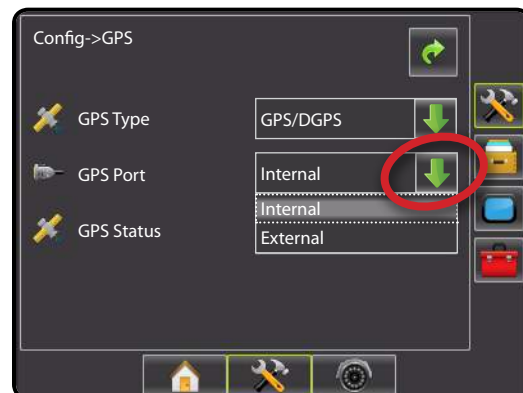
## GPS Port

GPS Port sets port transmission to Internal or External.

1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ Internal – use the internal (D)GPS (if equipped) and transmit out
  - ▶ External – receive external (D)GPS data

*NOTE: Working with GPS signals such as OmniStar HP/XP or RTK will require GPS port to be set to External.*

Figure 6-55: GPS Port



## External Receiver Minimum Configuration Requirements

Before the Matrix will connect and work with an external GPS receiver, these minimum configuration requirements must be met.

### Serial Port Settings

Baud rate:	19,200
Data Bits:	8
Parity:	None
Stop Bits:	1

### Serial Port connection requirements

Male 9 pin RS-232 serial cable

*NOTE: May require Null modem adapter depending on pin out of receiver.*

### NMEA Strings

GGA	5 Hz
Optional VTG	5 Hz, 2 Hz, Off
ZDA	0.2 Hz

## GPS Status

GPS Status displays information regarding data rates, number of satellites in view, and satellite quality and ID.

- Press **Information**.
- View data including:
  - ◀GGA/VTG (Data Rates) – the number of GPS positions per second
  - ◀Num Sats – the number of GPS satellites in view (minimum of 4 are required for DGPS)
  - ◀HDOP – a measure of satellite geometry strength in the horizontal plane. A HDOP value of less than 2 is preferred
  - ◀PRN – the current DGPS satellite ID.
  - ◀GGA Quality – the current quality indicator of the GPS signal. (see GGA chart)
  - ◀Receiver – the current indicator of the receiver
  - ◀Version – the software version installed on the receiver
- Press **OK** to return to GPS setup screen

Figure 6-56: GPS Status



*NOTE: If GPS is not available, all entries will be "Invalid"*


## GGA Requirements

GGA Quality required to be able to work with various types of signal can vary. See table below for requirements.

Service	Indicator	Accuracy
GPS only	1	<3 m
WAAS/EGNOS/Beacon	2	<1 m
RTK	4	4 cm
OmniStar HP/XP	5	10 cm
ClearPath®/Glide	9	<1 m

## Video

Video Setup is used to set up individual cameras while using an Eight (8) Channel or Four (4) Channel Video Selector Module (VSM) or a single directly connected camera. Up to 8 cameras can be configured if a VSM is installed.

1. Press CONFIGURATION side tab .
2. Press **Video**.
3. Select the appropriate check box(es):
  - ▶ Reverse – **ABC**
  - ▶ Upside Down – **VBC**



For normal video view **ABC** un-check all check boxes.
4. Press RETURN arrow  or CONFIGURATION side tab  to return to the main Configuration screen.

Figure 6-57: Video



## Video Setup Unavailable

If a camera or VSM is not connected, setup options will not be available.

Figure 6-58: Video Unavailable



## RealView Camera Full Screen Video View

View video feed(s) and setup cameras without GPS available. Options for RealView Guidance are not available on this screen.


1. Press REALVIEW CAMERA FULL SCREEN VIDEO VIEW bottom tab .

Figure 6-59: RealView Camera Full Screen Video View



**Single Camera - Matrix Pro 570G**

When a single camera is attached to the Matrix Pro 570G, only Camera A will be available for setup.

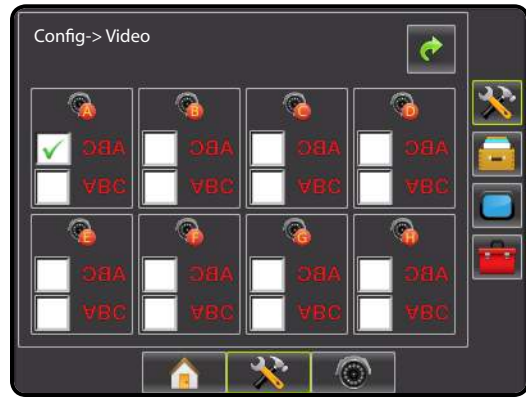
Figure 6-60: Video w/ Single Camera



**Eight Channel VSM**

When an eight (8) channel VSM is on the system, up to eight (8) cameras can be installed and configured.

Figure 6-63: Video w/ Eight Channel VSM



**Single Camera - Matrix Pro 840G**

When a single camera is attached to the Matrix Pro 840G, no setup options will be available.

Figure 6-61: Video w/ Single Camera



**Four Channel VSM**

When a four (4) channel VSM is on the system, up to four (4) cameras can be installed. Only Cameras A, B, C and D will be available for setup.

Figure 6-62: Video w/ Four Channel VSM



 DATA MANAGEMENT

Data Management allows for creation of job reports, storing of job data and clearing of stored jobs.

To access the Data Management Setup screens:



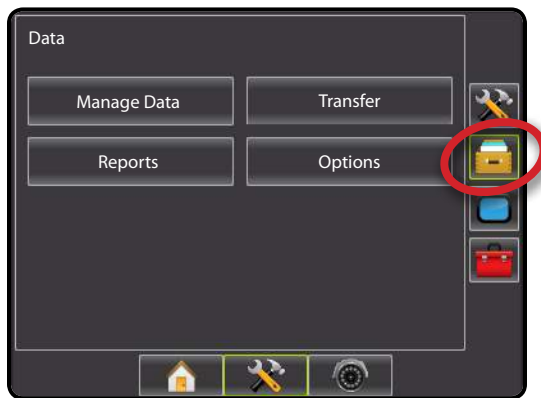
1. Press UNIT SETUP bottom tab .
2. Press DATA MANAGEMENT side tab .
3. Select from:
  - ▶ Manage Data – in advanced job mode, used to delete a job or duplicate a job’s Guideline Data, Boundary Data and/or Applied Data
  - ▶ Transfer – in advanced job mode, used to manage job data (delete, import, export)
  - ▶ Reports – used to create job reports and save them to a USB drive
  - ▶ Options – used to select simple job mode or advanced job mode

Figure 6-64: Data Management Options



### Manage Data

When in advanced job mode, the Manage Data screen allows the duplicating of a selected job’s Guideline Data, Boundary Data and/or Applied Data to a new job as well as deleting a selected job.




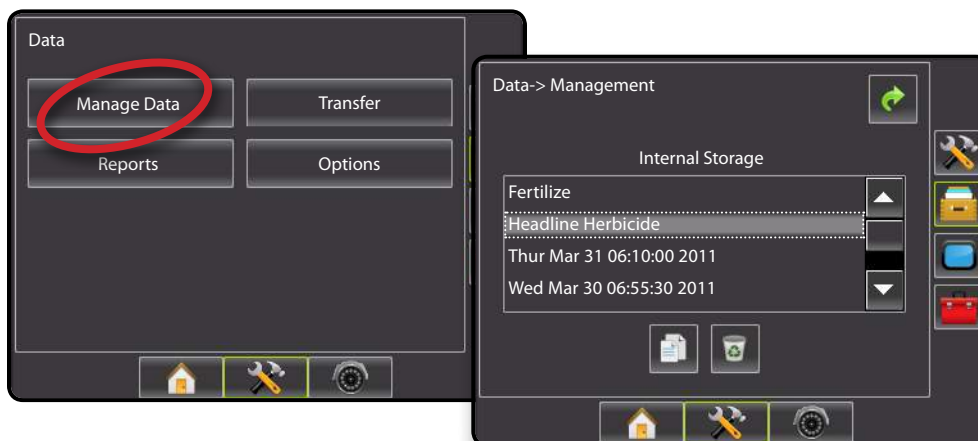
1. Press DATA MANAGEMENT side tab .
2. Press **Manage Data**.
3. Select from:
  - ▶ Duplicate Job Data – used to duplicate a job’s Guideline Data, Boundary Data and/or Applied Data
  - ▶ Delete Job Data from Internal Storage – used to delete job data from internal storage
4. Press RETURN arrow  or DATA MANAGEMENT side tab  to return to the main Data Management screen.

Figure 6-65: Manage Data

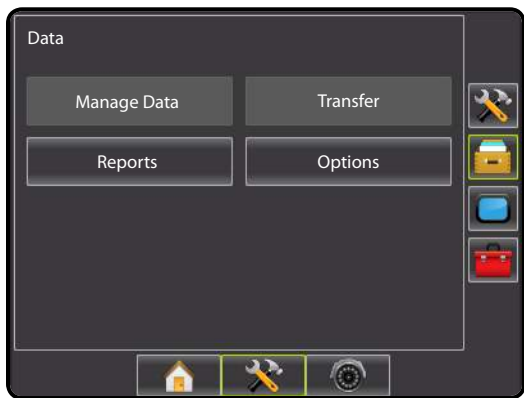


**Manage Data Unavailable**

The job(s) shown on the Manage Data screen are not available for selection when a job is active/started. Stop the current job to enable the Manage Data function.

Manage Data is not available in Simple Job Mode (option is greyed out).

Figure 6-66: Manage Data Unavailable



**Duplicate Job Data**

Duplicate Job Data is used to duplicate a job's Guideline Data, Boundary Data and/or Applied Data.


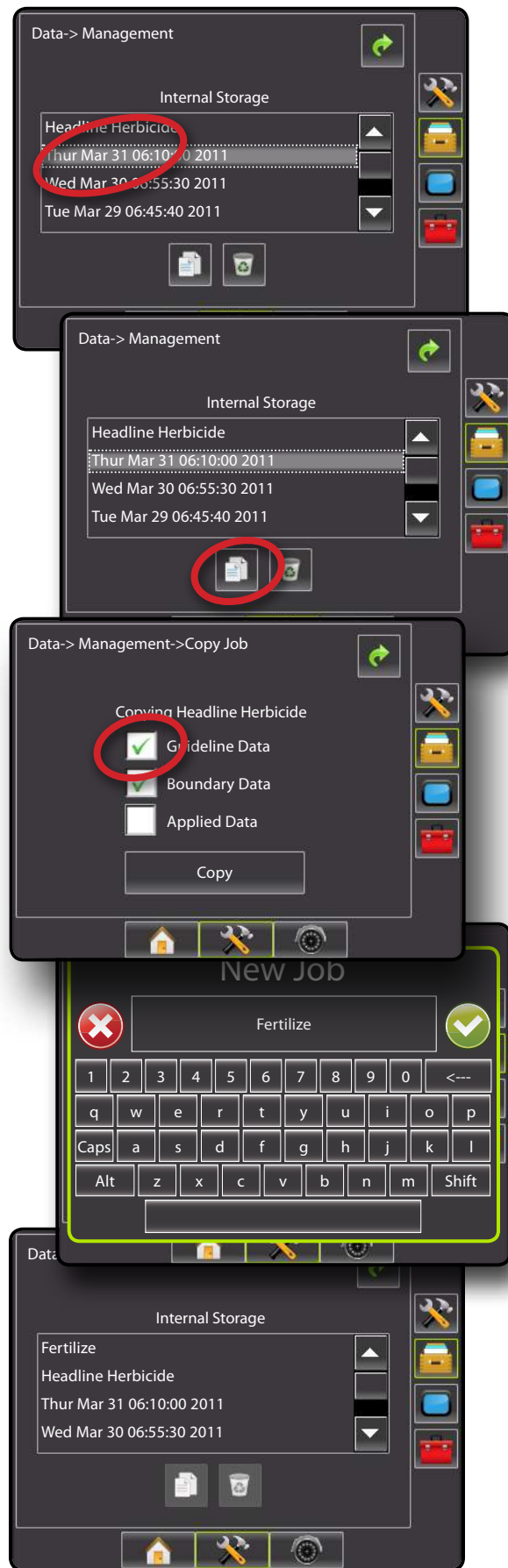

1. Under Internal Storage, select the job to be used for duplication.
2. Press DUPLICATE icon .
3. Select the appropriate check box(es):
  - ▶ Guideline Data
  - ▶ Boundary Data
  - ▶ Applied Data
4. Press **Copy**.
5. Enter a new job name using the on screen keyboard.

Figure 6-67: Duplicate Job Data



## Delete Job Data

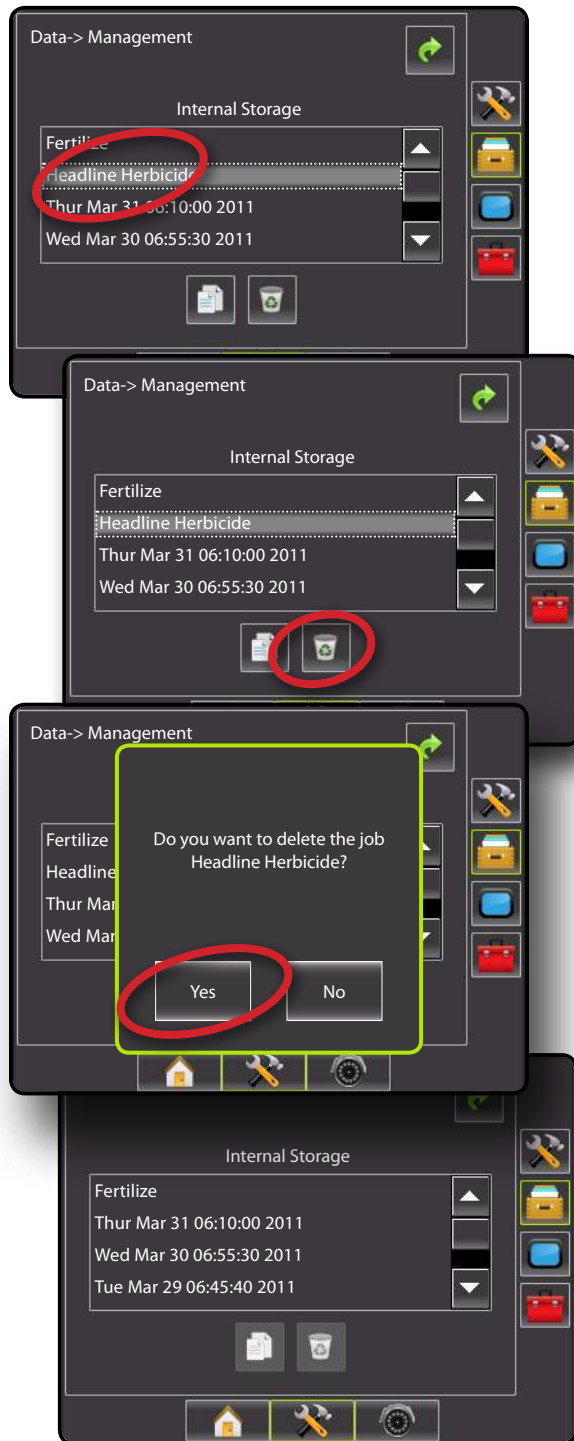
Delete job data from internal storage.

1. Select the job to be deleted.
2. Press RECYCLE BIN icon .
3. An information box will appear prompting for confirmation.

Press:

- ▶ Yes – to delete the saved job data
- ▶ No – to cancel and return to the Transfer screen

Figure 6-68: Delete Job Data



## Transfer

When in advanced job mode, the transfer screen allows the exporting or importing of selected jobs to or from a USB drive as well as deleting jobs.

Jobs exported to a USB storage device can be opened and updated using Fieldware Link. In Fieldware Link a user can input client, farm and field data as well as duplicate/edit jobs for reuse of boundaries and guidelines. From Fieldware Link, jobs can be ported back to a USB storage device to be imported back onto the console's internal storage for use.




1. Press DATA MANAGEMENT side tab .
2. Press **Transfer**.
3. Select from:
  - ▶ Export Job Data to USB Storage – used to move job data from internal storage to USB storage
  - ▶ Import Job Data to Internal Storage – used to move job data from USB storage to internal storage
  - ▶ Delete Job Data from Internal Storage – used to delete job data from internal storage
4. Press RETURN arrow  or DATA MANAGEMENT side tab  to return to the main Data Management screen.

Figure 6-69: Transfer



**Transfer Unavailable**

The job(s) shown on the Transfer screen are not available for selection when a job is active/started. Stop the current job to enable the Transfer function.

Transfer is not available in Simple Job Mode (option is greyed out).

*Figure 6-70: Transfer Unavailable*



**USB Storage**

Export job data from internal storage to USB storage.

1. Insert a USB drive into the console.
2. Under Internal Storage, select the job name to be exported.
3. Press RIGHT arrow → to export the job to the USB Storage.
4. Repeat as needed.
5. Remove USB Drive from the console.

*Figure 6-71: Export Job Data to USB Storage*



### Internal Storage

Import job data from USB storage to internal storage.


1. Insert a USB drive into the console.
2. Select the job name to be imported in the Internal Storage.
3. Press LEFT arrow ← to import the job to Internal Storage.
4. Repeat as needed.
5. Remove USB Drive from the console.

Figure 6-72: Import Job Data From USB Storage



### Delete Job Data

Delete job data from internal storage.

1. Select the job to be deleted.
2. Press RECYCLE BIN icon .
3. An information box will appear prompting for confirmation.

Press:

- ▶ Yes – to delete the saved job data
- ▶ No – to cancel and return to the Transfer screen

Figure 6-73: Delete Job Data










## Reports

Reports is used to create job reports and save them to a USB drive:

*NOTE: If Simple Job Mode is selected in the Options page, only the current job can be saved.*

*When a job is active/started, Reports are not available for selection. Stop the current job to enable the function.*

*When closing a job with a USB drive in the console, you get the option to create a report on the current job.*

1. Press DATA MANAGEMENT side tab .
2. Press **Reports**.
3. Insert USB drive into the console.
4. Select the job to be saved
5. Select:
  - ▶ PDF  – report for print
  - ▶ KML  – Google Earth Map
  - ▶ SHP  – ESRI shape data
  - ▶ ALL  – all available file types
6. Press RETURN arrow  or DATA MANAGEMENT side tab  to return to the main Data Management screen.





*NOTE: The file icons     or buttons are not available for selection (greyed out) until a USB drive is inserted properly.*

Figure 6-74: Reports - Advanced Job Mode



Figure 6-75: Reports - Simple Job Mode

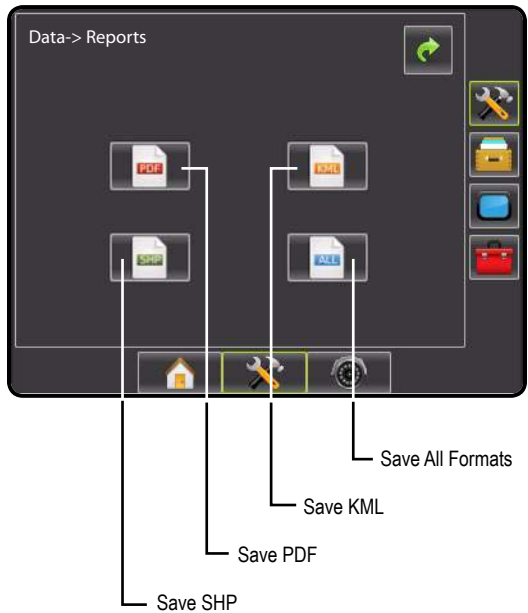


### Simple Job Mode Options

If 'Simple' Job Mode is selected in the Options page, only the current job can be reported.

1. Insert a USB drive into the console.
2. Press the desired file format and the report will be generated and saved to the USB drive.
3. An information box will appear as confirmation that the report(s) were saved successfully.
4. Repeat as needed.
5. Remove USB Drive from the console.

Figure 6-76: Reports Options



### Advanced Job Mode Options

If 'Advanced' Job Mode is selected in the Options page, any stored job can be reported.

1. Insert a USB drive into the console.
2. Under Internal Storage, select the job name to be reported.
3. Press the desired file format and the report will be generated and saved to the USB drive.
4. An information box will appear as confirmation that the report(s) were saved successfully.
5. Repeat as needed.
6. Remove USB Drive from the console.

Figure 6-77: Save PDF

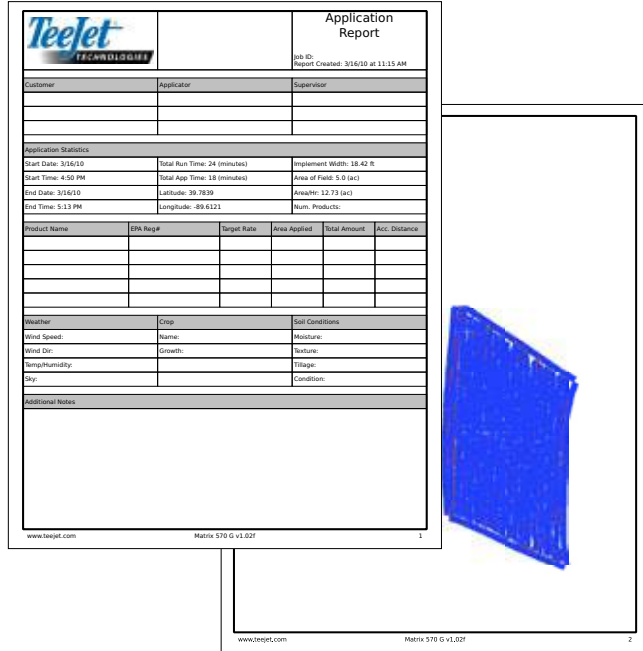


**More Information on File Formats**

**PDF Report**

Selecting to save a PDF report will create a pre-built PDF report with associated coverage map. Customer information, weather data and field data will have to be entered manually.

Figure 6-78: PDF Report Example



**NOTE:** The PDF report is available in all languages and generated in the current language selection.

**KML Data**

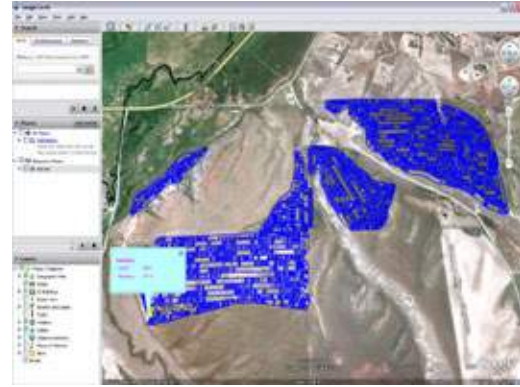
Selecting to save a KML file will create a Google Earth file. A KML file can be overlaid on top of Google Maps to view application areas on a map.

KML, or Keyhole Markup Language, is an XML grammar and file format for modeling and storing geographic features such as points, lines, images, polygons, and models for display in Google Earth, Google Maps and other applications. You can use KML to share places and information with other users of these applications.

A KML file is processed by Google Earth in a similar way that HTML and XML files are processed by web browsers. Like HTML, KML has a tag-based structure with names and attributes used for specific display purposes. Thus, Google Earth acts as a browser of KML files.

Please visit Google.com for more details and viewing instructions.

Figure 6-79: KML Google Data Overlay Example



**ESRI Data**

Selecting to save a SHP file will create a GIS (Geographic Information System) or shapefile. Shape files are a useful tool as many customers use third party GIS software to plot, store and analyze data collected by the Matrix 570G.

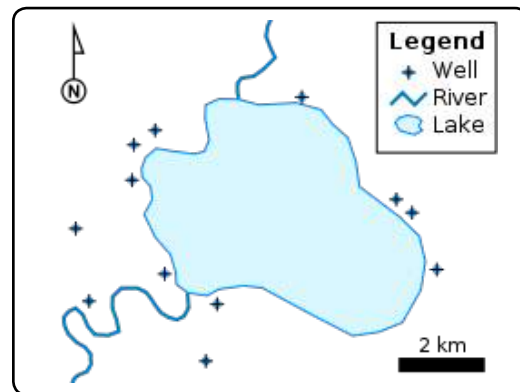
*"Balancing the inputs and outputs on a farm is fundamental to its success and profitability. The ability of GIS to analyze and visualize agricultural environments and workflows has proven to be very beneficial to those involved in the farming industry."*

*From mobile GIS in the field to the scientific analysis of production data at the farm manager's office, GIS is playing an increasing role in agriculture production throughout the world by helping farmers increase production, reduce costs, and manage their land more efficiently."*

— ESRI.com

A shapefile is a digital vector storage format for storing geometric location and associated attribute information.



Figure 6-80: ESRI Data Example





## Options

Options allows the operator to select between Simple or Advanced Job Mode.

**WARNING!** Changing job modes deletes all internal job data.

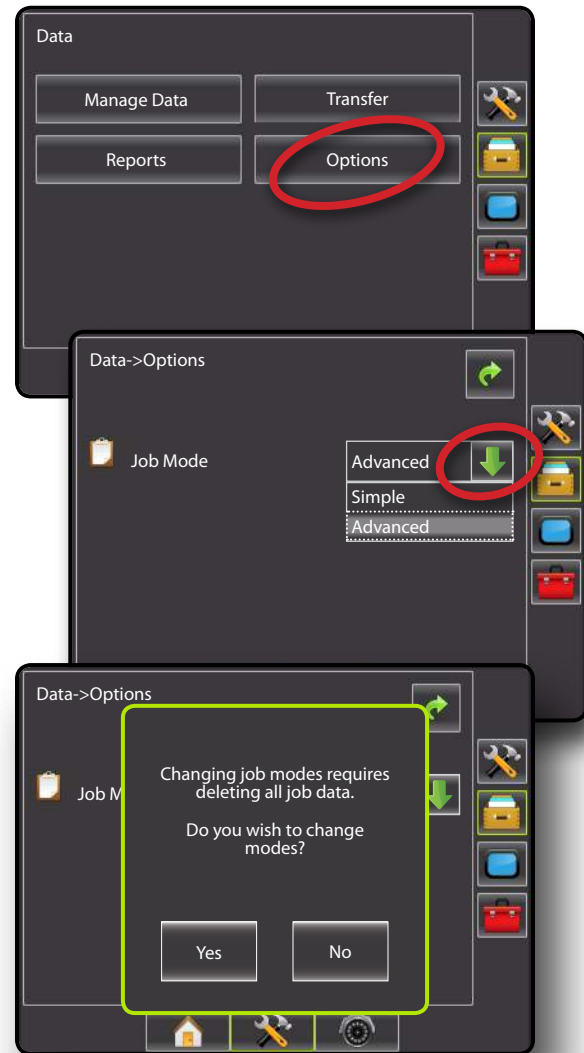
1. Press DATA MANAGEMENT side tab .
2. Press **Options**.
3. Press DOWN arrow  to access the list of options.
4. Select:
  - ▶ Simple – Only bounded and applied area are displayed on the home screen. Only the current job is available for saving in Reports. Job specific information input with Fieldware Link is not available.
  - ▶ Advanced – Client, farm, field, job, bounded area and applied area are displayed on the home screen. All saved jobs can be saved in Reports. With Fieldware Link, a user can input client, farm and field data as well as duplicate/edit jobs for reuse of boundaries and guidelines.
5. "Changing job modes requires deleting all job data. Do you wish to change modes?"
 

Press:

  - ▶ Yes – to make the change
  - ▶ No – to keep the current setting
6. Press RETURN arrow  or DATA MANAGEMENT side tab  to return to the main Data Management screen.

**NOTE:** The job stored in Reports is not available for selection (icons greyed out) when a job is active/started. Stop the current job to enable the Reports function.

Figure 6-81: Options - Change Job Mode



## CONSOLE

Console Setup is used to configure Color Scheme, LCD Brightness, Screenshot and Screen Calibrate. and volume. Cultural settings covering Units, Language and Time Zone and About information as well as Save system software information can also be accessed from this screen.



1. Press UNIT SETUP bottom tab .
2. Press CONSOLE side tab .
3. Select from:
  - ▶ Display – used to configure color scheme and LCD brightness, establish screenshot availability and calibrate the touchscreen
  - ▶ Cultural – used to configure units, language and time zone settings
  - ▶ Sound – used to adjust the volume level of the audio speaker
  - ▶ About – used to display the system software version as well as the software versions of modules connected to the CAN bus

Figure 6-82: Console Options



### Display

Settings related to the display can be changed here.




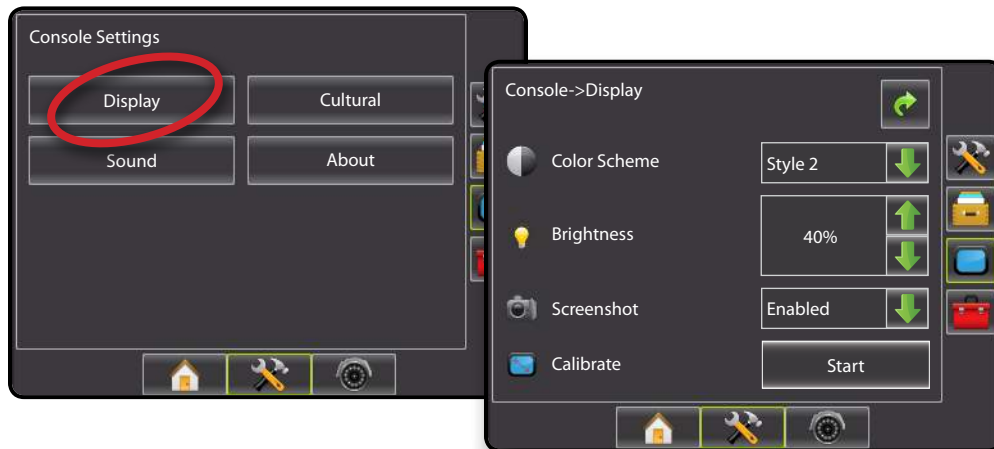
1. Press CONSOLE side tab .
2. Press **Display**.
3. Select from:
  - ▶ Color Scheme – used to change the background and text colors of the display
  - ▶ Brightness – used to adjust the brightness of the console display
  - ▶ Screenshot – used to allow screen images to be saved a USB drive
  - ▶ Calibrate – used to force a touch screen calibration
4. Press RETURN arrow  or CONSOLE side tab  to return to the main Console Settings screen.

Figure 6-83: Console Options



## Color Scheme

Color Scheme changes the background and text colors of the display.


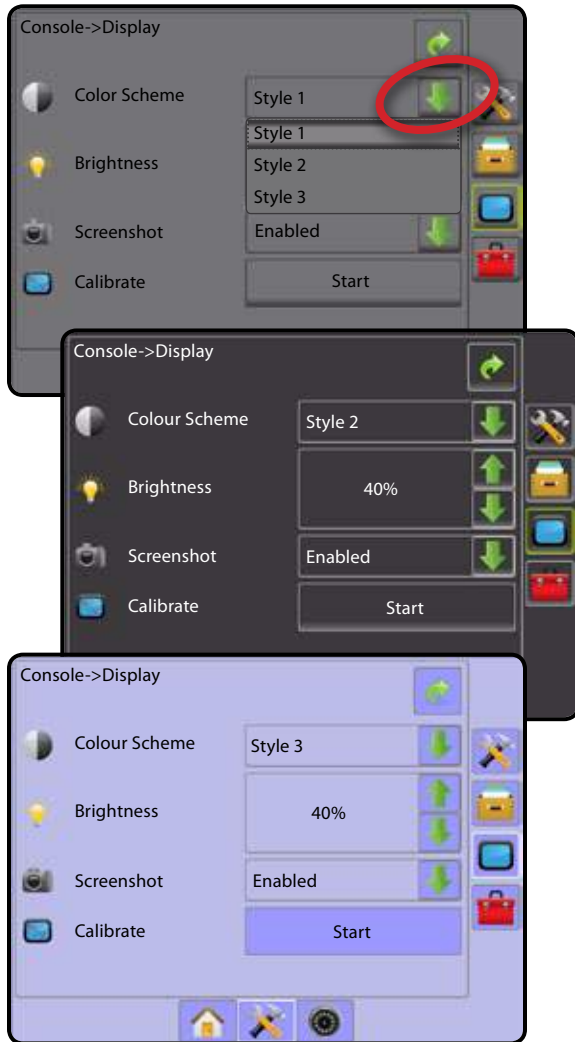


1. Press DOWN arrow  to access the list of options.
2. Select style.

Figure 6-84: Color Scheme



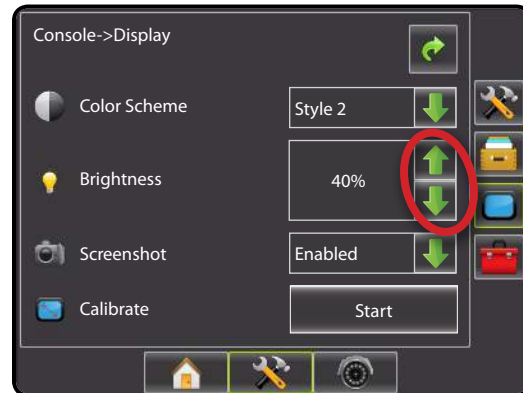
## Brightness

Adjusts the brightness of the display.

1. Press:
  - ▶ UP arrow  to brighten the display
  - ▶ DOWN arrow  to darken the display

**WARNING!** In hot conditions, settings above 50% may cause a High Temperature Warning. The console will automatically dim the screen to reduce the console temperature.

Figure 6-85: Brightness



## Screenshot

Screenshot allows screen images to be saved to a USB drive.

To aid when troubleshooting problems in the field, an end user can use Screenshot to save a screen to a USB drive, and then e-mail the image to support personnel.

If the USB drive is removed from the console, the icon will become inactive (greyed out).



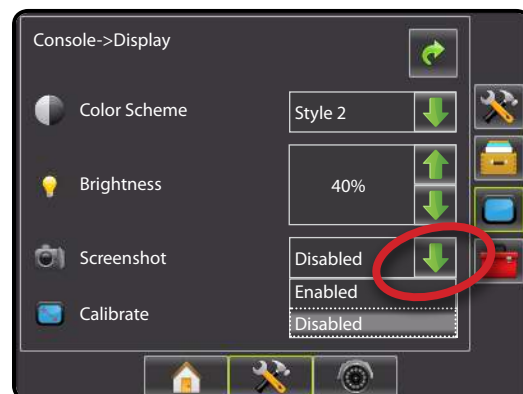
1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ Enable – a screenshot icon  is displayed on the upper right of each screen.
  - ▶ Disable – removes the camera from the upper right of the screen

Figure 6-86: Screenshot Disabled



**Capture a Screenshot**


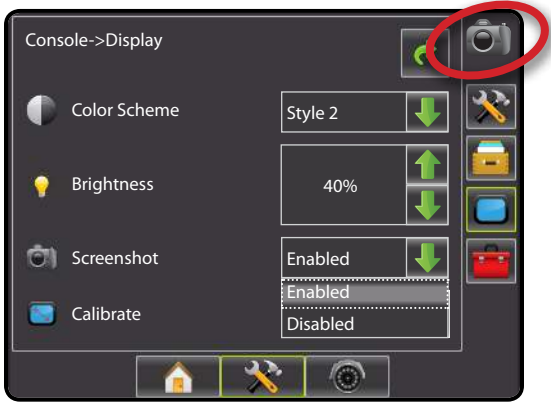
1. Insert a USB drive into the USB port on the console
2. Go to the desired screen and press the SCREENSHOT icon  in the upper right corner of the screen.
3. The console will make a click sound when the image is captured and saved on the USB drive.

Figure 6-87: Example of Screenshot Icon on Screen

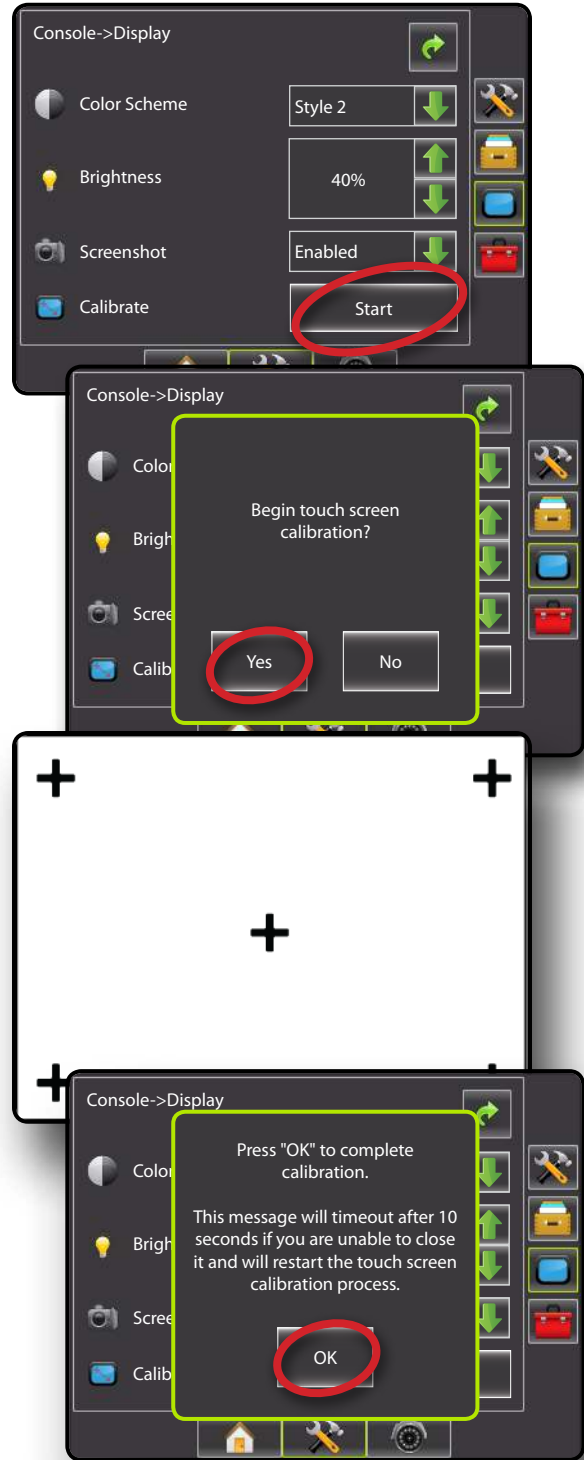


**Touch Screen Calibration**

Touch Screen Calibration is used to activate a touch screen calibration.

1. Select **Start**.
2. "Begin touch screen calibration?"  
Press:  
  - ▶ Yes – to perform touch screen calibration
  - ▶ No – to return to the display options screen
3. Press series of 5 crosshairs **+**.
4. Press **OK** to complete the touch screen calibration

Figure 6-88: Touch Screen Calibration



## Cultural

Culture is used to configure Units, Language and Time Zone settings.





1. Press CONSOLE side tab .
2. Press **Cultural**.
3. Select from:
  - ▶ Units – used to define the system measurements
  - ▶ Language – used to define the system language
  - ▶ Time Zone – used to establish the local time zone
4. Press RETURN arrow  or CONSOLE side tab  to return to the main Console Settings screen.

Figure 6-89: Cultural Options



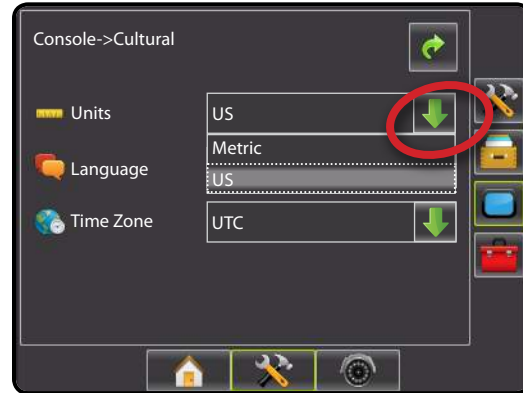
## Units

Units defines the system measurements (U.S. or Metric).

1. Press DOWN arrow  to access the list of options.
2. Select:
  - ▶ U.S.
  - ▶ Metric

*NOTE: This setting is required for Assisted/Auto Steering and Tilt Sensor Operation, as well as proper BoomPilot operation.*

Figure 6-90: Units



## Language

Languages defines the system language. Options include but are not limited to: Chinese, Czech, Danish, Dutch, English - American, English - International, Estonian, Finnish, French, German, Hungarian, Italian, Japanese, Polish, Portuguese - European, Portuguese - Brazilian, Romanian, Russian, Serbian, Spanish - European, Spanish - Central/South American and Swedish.

1. Press DOWN arrow  to access the list of options.
2. Select between the available languages.


*NOTE: Changing to or from some languages will require the console to be manually restarted for language to appear correctly. An information box will pop-up when this is required.*

Figure 6-91: Language



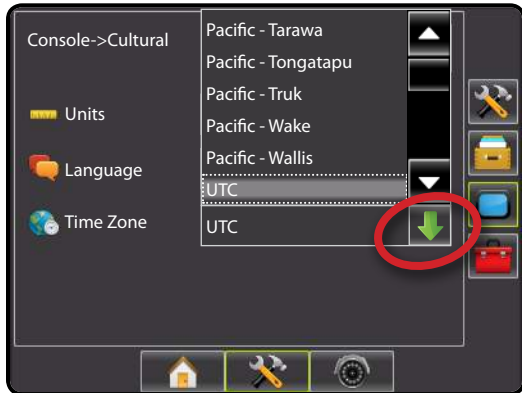
## Time Zone

Time zone establishes the local time zone.

1. Press DOWN arrow  to access the list of options.
2. Select the appropriate time zone.

Time zones are listed alphabetically by continent then city. A list of the continents and cities is in Appendix A.

Figure 6-92: Time Zone



## Sound

Sound adjusts the volume level of the audio speaker. Range is 0 - 100.





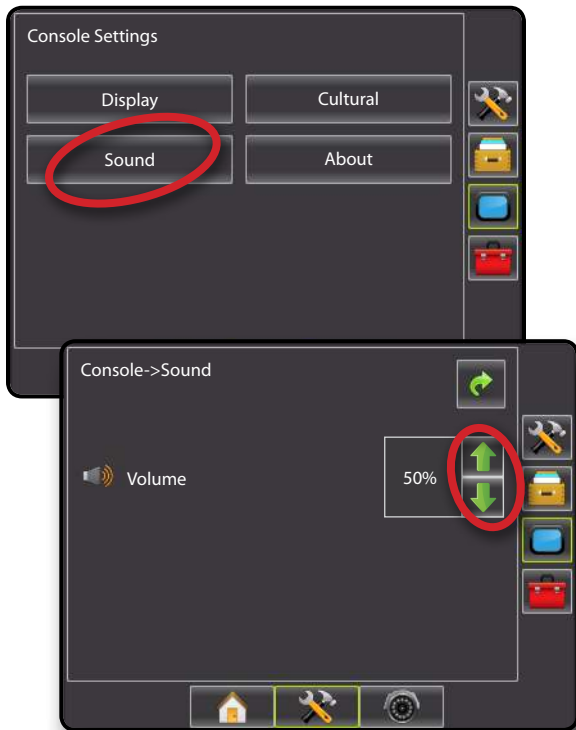
1. Press:
  - ▶ UP arrow  to increase the sound
  - ▶ DOWN arrow  to soften the sound
2. Press RETURN arrow  or CONSOLE side tab  to return to the main Console Settings screen.


Figure 6-93: Sound Options



## About



About/Save screen displays the system software version as well as the software versions of modules connected to the CAN bus.

To aid when troubleshooting problems in the field, an end user can use Save to download a text file containing current software information to a USB drive, then e-mail the file to support personnel.

1. Press CONSOLE side tab .
2. Press **About** to view data including:
  - ◀ Unit Model Number
  - ◀ Software Version
  - ◀ Connected Modules

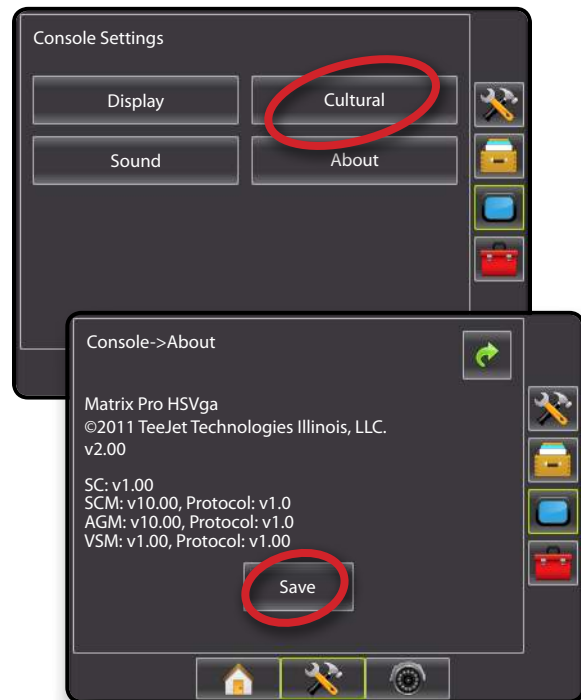
OR

Press **Save** to save the About information to a USB Drive “Saved version information to USB drive” will confirm save.

3. Press RETURN arrow  or CONSOLE side tab  to return to the main Console Settings screen.

*NOTE: The **Save** option is not available for selection (grayed out) until a USB drive is inserted properly.*

Figure 6-94: About Options



 TOOLS

The Tool menu allows the operator to do various calculations on a regular calculator or on a unit converter. The unit converter calculates various measurements based on area, length or volume.



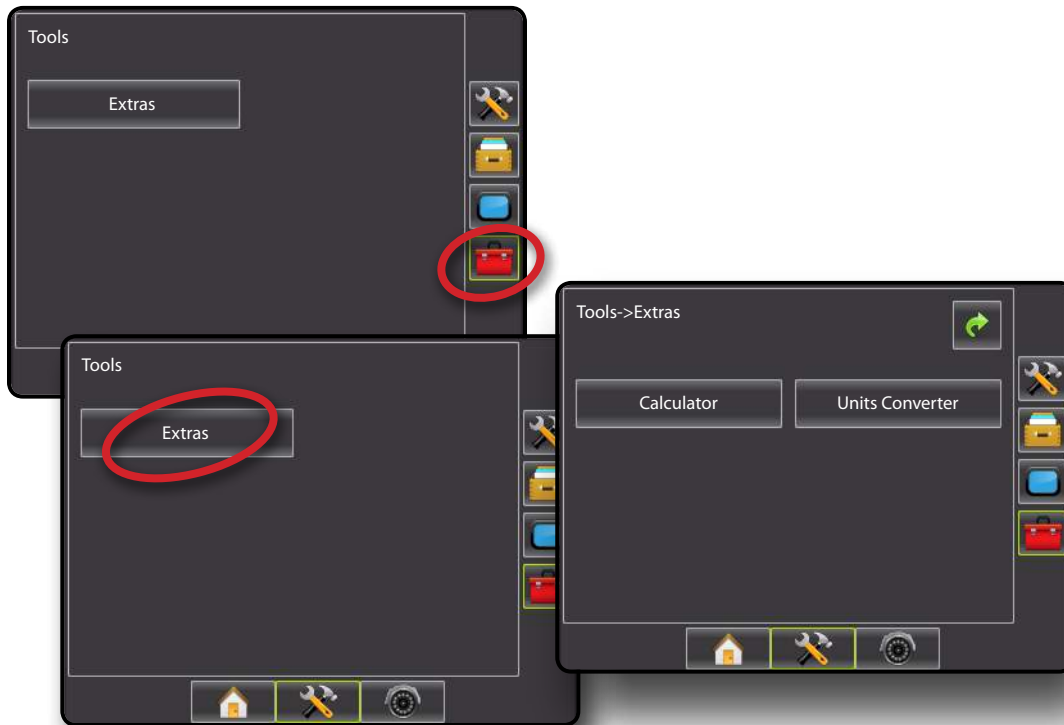
1. Press UNIT SETUP bottom tab .
2. Press TOOLS side tab .
3. Press **Extras**.
4. Select from:
  - ▶ Calculator – used to perform mathematical calculations
  - ▶ Units Converter– used to perform unit conversions for area, length and volume

Figure 6-95: Tools



## Calculator

The calculator is an on screen option to performing mathematical calculations.





1. Press TOOLS side tab .
2. Press **Extras**.
3. Press **Calculator**.
4. Press numbers and options on screen to perform calculations.
5. Press CANCEL  to close the calculator and return to the Extras screen.
6. Press RETURN arrow  or TOOLS side tab  to return to the main Tools screen.

Figure 6-96: Calculator

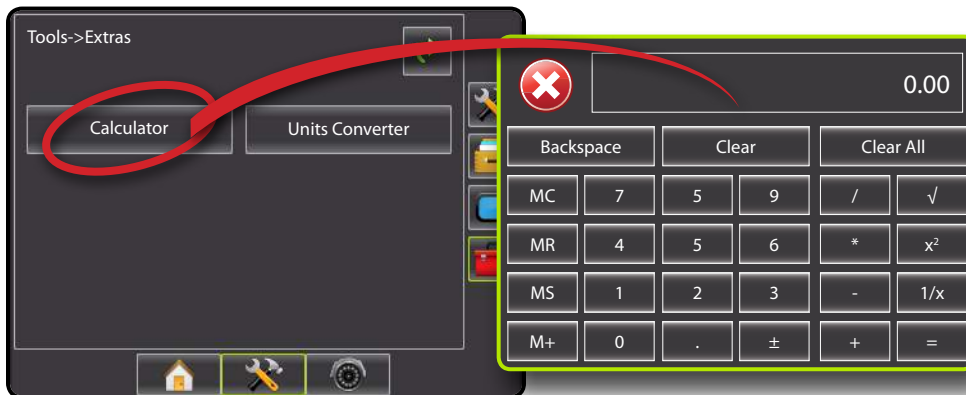




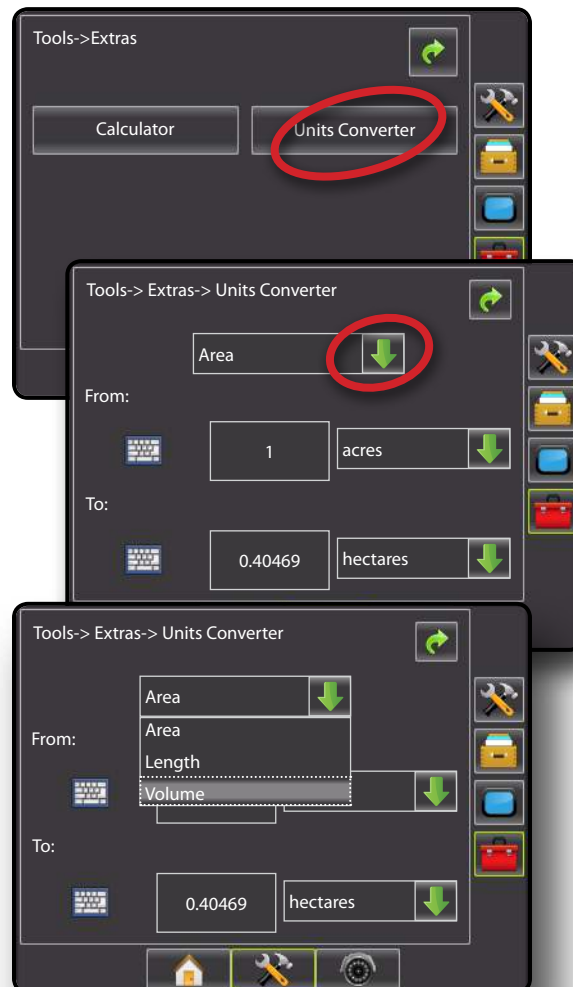


Figure 6-97: Units Converter

## Units Converter

The units converter is an on screen option to performing unit conversions for area, length and volume.

1. Press CONSOLE side tab .
2. Press **Units Converter**.
3. Press DOWN arrow  at the top of the screen to access the list of options.
4. Select from:
  - ▶ Area
  - ▶ Length
  - ▶ Volume
5. Set the From and To units
6. Select the From or To value
  - ◀ The opposite value will automatically update to the equivalent value in the selected unit.
7. Press RETURN arrow  or TOOLS side tab  to return to the main Tools screen.



### Set Units

1. Press DOWN arrow ↓ in the "From" section to access the list of measurement options.
2. Select measurement units.
3. Press DOWN arrow ↓ in the "To" section to access the list of measurement options.
4. Select measurement units.

Figure 6-98: Set "From:" Units (Area Converter)

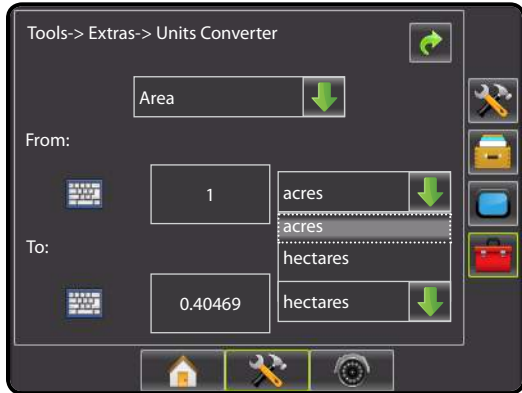
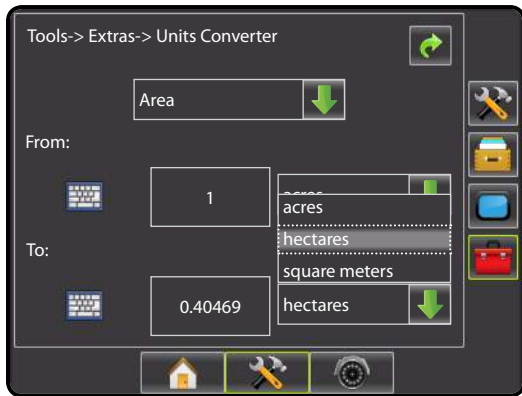





Figure 6-99: Set "To:" Units (Area Converter)



### Select Value










1. Press the KEYPAD icon .
2. Use the entry screen to establish the "From" value.
3. Press:
  - ▶ Accept  to save the settings
  - ▶ Cancel  to leave the keypad without saving

The "To" measurement will automatically update to the equivalent value in the selected unit.

Figure 6-100: Set Value (Area Converter)



## CHAPTER 7 – GUIDANCE

The Matrix Pro allows product application and vehicle guidance to be performed simultaneously. Once Unit Setup is complete, guidance can begin. Five guidance modes allow the operator to optimize the field work: Straight AB , Curved AB , Circle Pivot , Last Pass  and NextRow . Additional optimization can be accomplished with Boundary Application , Curved Lookahead  Return to Point  guidance and RealView Guidance Over Video .

Three guidance screens assist in keeping the user informed.

**Vehicle View Guidance** creates a computer-generated image of the vehicle position displayed in the application area



**Field View Guidance** creates a computer-generated image of the vehicle position and application area from an aerial perspective.



**RealView Guidance** allows live video input to be displayed instead of a computer-generated image.



To choose a Guidance Mode:








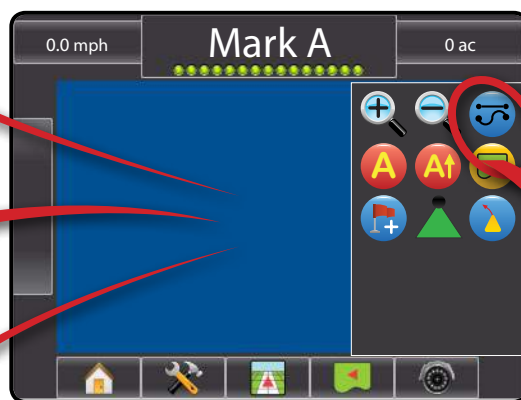
1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press GUIDANCE MODE icon .
3. Select from:
  - ▶ Straight AB 
  - ▶ Curved AB 
  - ▶ Circle Pivot 
  - ▶ Last Pass 
  - ▶ NextRow 

Figure 7-82: Choose a Guidance Mode



## Navigation Screens Icons

### Navigation and Guidance Options

Guidelines	
	Mark A  – Marks the first point of the guideline.
	Mark B  – Marks the end point of the guideline. Grayed = minimum distance has not been traveled.
	Cancel Mark A – Cancels the Mark A process. Reverts to previous AB guideline (when established).
	NextRow Mark B  – Marks the end point of the row.
	Azimuth Degree  – Establishes a straight guideline measured by degrees clockwise from a north base line. North = 0, East = 90, South = 180, West = 270.
	A+ Nudge – Shifts the existing guideline to the vehicle's current position.
	Next Straight AB or Azimuth Degree Guideline – Shows the next straight guideline saved in the current job.
	Next Curved AB Guideline – Shows the next Curved AB guideline saved in the current job.
	Next Circle Pivot Guideline – Shows the next Circle Pivot AB guideline saved in the current job.
	Curved Lookahead – Provides an indication of where the current steering will take the vehicle using a 'pointer' as guidance.

Return to Point	
	Mark Point  – Establishes a point at the vehicle location. Grayed = GPS is unavailable.
	Return to Point – Provides distance back to an established point. (Switch to Vehicle View to provide navigation back to an established point.)
	Cancel Point – Deletes the Marked Point.

BoomPilot	
	BoomPilot – Selects BoomPilot mode. Grayed = GPS is unavailable.

Boundaries	
	Mark Boundary – Establishes application area and determines no apply zones. Boundary is established to the outside of an applied pass. Grayed = GPS is unavailable.
	Finish Boundary – Finalizes boundary process. Boundaries can also be closed by travelling to within a swath width of the starting point. Grayed = minimum distance has not been traveled.
	Cancel Boundary – Cancels the new mark boundary process. Reverts to previous boundary (when established).
	Delete Boundary – Deletes all established boundaries from current job.

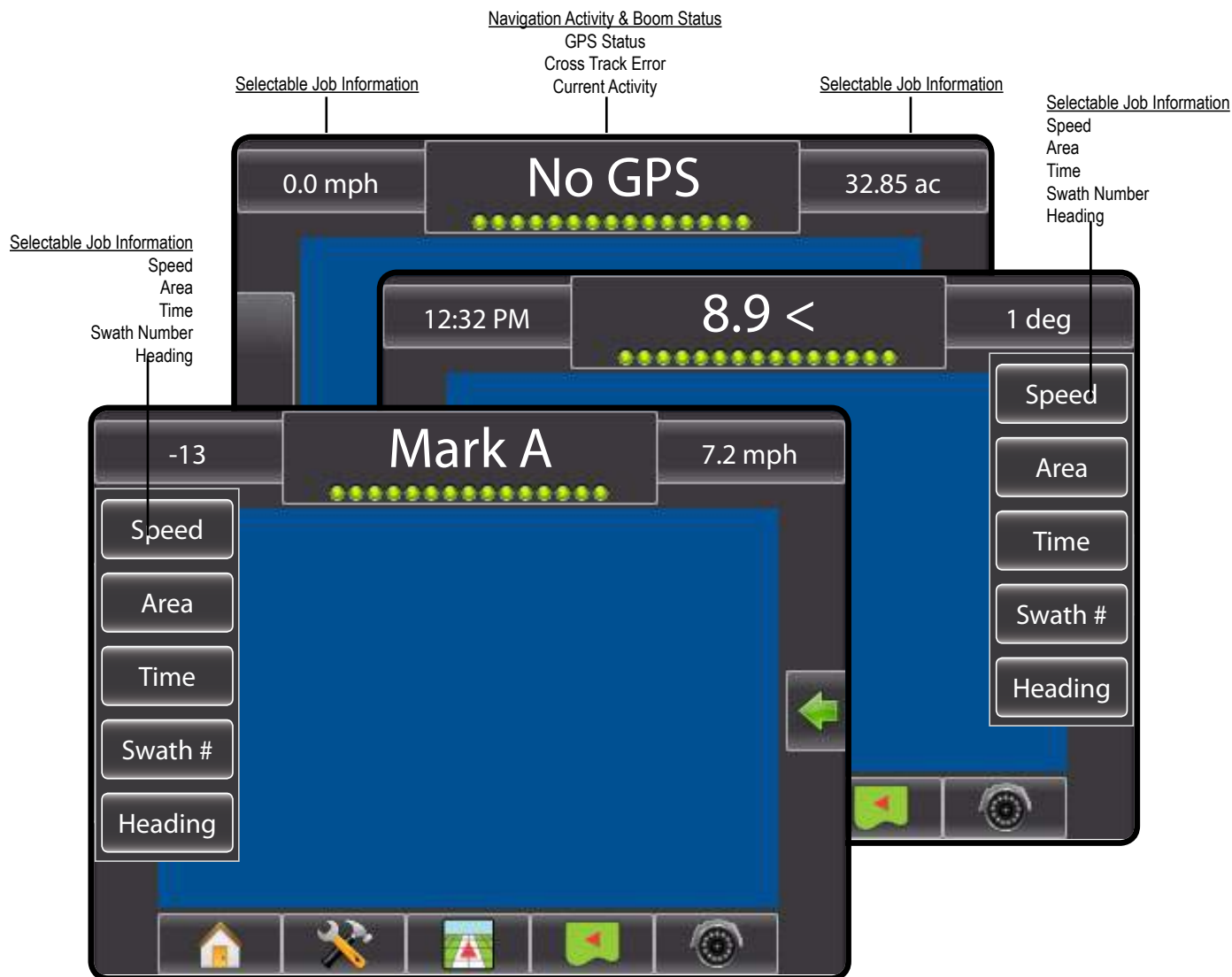
RealView Guidance Options	
	Video Camera Select – Selects one of up to eight camera views if a Video Selection Module (VSM) is attached.
	Split Camera View – Selects one of two sets of four camera inputs (A/B/C/D or E/F/G/H) to divide the screen into four separate video feeds.
	Guidance Over Video Setup – Access to turn on Guidance Over Video or Steering Angle and adjust guidelines.
	Guidance Over Video – Places three-dimensional guidelines over the video feed for navigational assistance.
	Steering Angle – Displays the direction in which the steering wheel needs to be adjusted.
	Up & Down Icons – Used to adjust the guidance lines to match the camera's view.

Screen Options	
Zoom Options –	
	Icons – To be used on the Matrix Pro 570GS
	Buttons – To be used on the Matrix Pro 840GS
	Vehicle View – Icons or buttons adjust the vehicle's view or perspective to the horizon from vehicle view to bird's eye view.
	Field View – Icons or buttons increase/decrease the area displayed on the screen.
	Pan – Touching the screen allows operator to focus on specific map areas without moving the vehicle. Arrows on screen move the view  in the corresponding direction.
	World View – Extends screen view to the widest area available.

**GUIDANCE BAR**

The Guidance bar keeps you informed of your choice of selectable job information (Current Speed, Accumulated Area, Current Time, Swath Number and Heading), Navigation Activity (Cross Track Error (feet or meters), Current Activity and GPS Status) and Boom Status.

Figure 7-1: Guidance Bar Examples



**Selectable Job Information**

- Speed – Displays the current speed of travel
- Area – Displays the accumulated area that has had application applied
- Time – Displays the current time based on the selected time zone
- Swath Number – Displays the current swath number in reference to the initial guidance line. Number will be shown as a positive number when the vehicle is to the right of the AB baseline or a negative number when the vehicle is to the left of the AB baseline)
- Heading – Displays the course of travel based clockwise from a north base line. North = 0, East = 90, South = 180, West = 270.

**Navigation Activity & Boom Status**

- GPS Status – Displays “No GPS” when GPS is unavailable or “Slow GPS” when GPS is receiving GGA data at less than 5Hz.
- Cross Track Error – Displays the distance from your desired guideline.
- Current Activity – Displays activities such as mark an A or B point, approaching the end of a row, indicating to turn now and distance to return to a marked point.
- Boom Status – One dot is displayed for each boom section programmed. A green dot indicates the section is active, a red dot indicates the section is not currently active.

STATUS BAR

The Status Bar provides information on GPS Status, Guidance Mode, Boundary Area, Assisted/Auto Steering Engagement and Implement Control Status.

Figure 7-2: Status Bar



Figure 7-3: Status Bar Icons

<p><b>GPS Status</b></p> <ul style="list-style-type: none"> <li> Red = no GPS</li> <li> Yellow = GPS only</li> <li> Green = DGPS, WAAS/RTK, GLONASS</li> <li> Peach = Glide/ClearPath</li> </ul>	<p><b>Assisted/Auto Steering Status</b></p> <ul style="list-style-type: none"> <li> Green = Engaged, actively steering</li> <li> Yellow = Enabled, all conditions have been met to allow for assisted/auto steering</li> <li> Red = Disabled, all conditions have not been met to allow for assisted/auto steering.</li> <li>No icon = no assisted/auto steering system installed on system</li> </ul>
<p><b>Guidance Mode</b></p> <ul style="list-style-type: none"> <li> Straight AB Guidance</li> <li> Curved AB Guidance</li> <li> Circle Pivot Guidance</li> <li> Last Pass Guidance</li> <li> NextRow</li> <li>No icon = No Guidance</li> </ul>	<p><b>BoomPilot Status</b></p> <ul style="list-style-type: none"> <li> Red = Off/Manual</li> <li> Green = Automatic</li> <li> Yellow = All On</li> <li>No icon = Single Boom Section (no SmartCable or SDM installed on system)</li> </ul>
<p><b>Bounded Area Status</b></p> <ul style="list-style-type: none"> <li> Outside Boundary = Currently traveling outside bounded area</li> <li> Inside Boundary = Currently traveling inside bounded area</li> <li>No icon = No boundary established</li> </ul>	

## Status/Information Screens

### GPS Status

GPS Status displays information regarding data rates, number of satellites in view, and satellite quality and ID. See GPS section in Setup Chapter of this manual for more information.


- Press GPS STATUS icon  to view data including:
  - ◀GGA/VTG (Data Rates) – the number of GPS positions per second
  - ◀Num Sats – the number of GPS satellites in view
  - ◀HDOP – a measure of satellite geometry strength in the horizontal plane
  - ◀PRN – the current DGPS satellite ID
  - ◀GGA Quality – the current quality indicator of the GPS signal
  - ◀Receiver – the current indicator of the receiver

Figure 7-4: GPS Status



### Guidance Mode Status

Guidance Mode Status displays information regarding the pattern of guidance, name of the current guideline and how many guidelines are saved in the console.


- Press GUIDANCE MODE icon  to view data including:
  - ◀Pattern – current guidance mode
  - ◀Name – name of the current guideline
  - ◀Total – how many guidelines are saved in the current job

Figure 7-5: Guidance Mode Status



### Bounded Area Status

Bounded Area Status displays information regarding the areas in the current boundaries.


- Press BOUNDED AREA icon  to view data including:
  - ◀Working Area – the total area of the external boundary excluding the internal bounded areas
  - ◀Field Area – the total area of the external boundary
  - ◀Internal Area – the area excluded from the active area (or the total area of the internal bounded areas)

Figure 7-6: Bounded Area Status



**Assisted/Auto Steering Status**

Assisted/Auto Steering Status displays information regarding the current status of the assisted/auto steering system.

1. Press AUTOSTEER STATUS icon (🟢🟡🔴) to view the assisted/auto steering status.

Figure 7-7: Assisted/Auto Steering Status

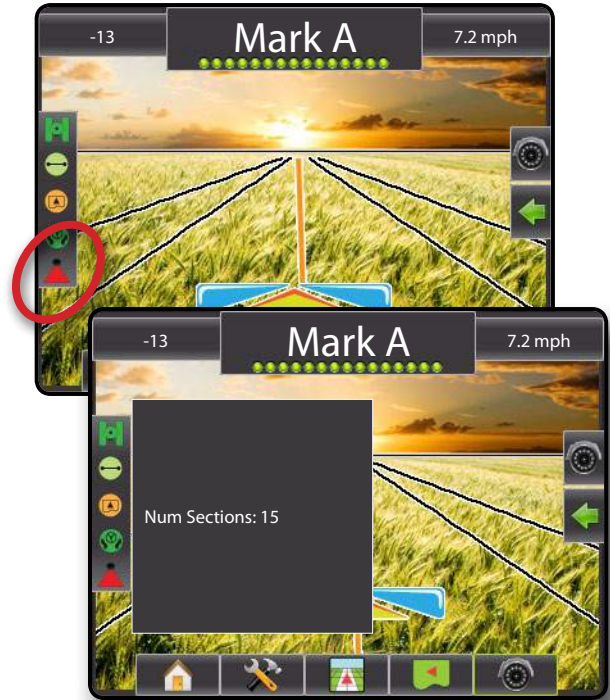


**BoomPilot Status**

BoomPilot Status displays information regarding the current status of the BoomPilot system

1. Press BOOMPILOT STATUS icon (🟢🔴🟡) to view the number of sections.

Figure 7-8: BoomPilot Status



## NAVIGATION SCREENS

Matrix Pro guidance and navigation can be accessed from the Vehicle View screen, Field View screen or RealView screen.



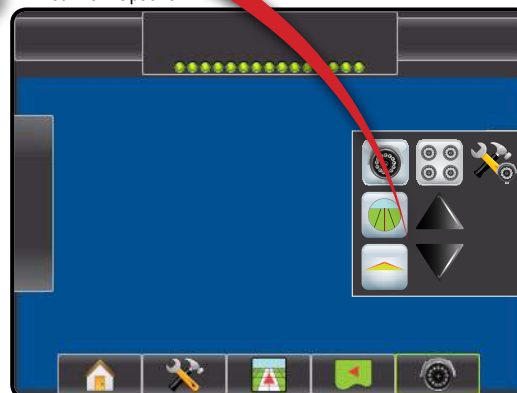
- Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options
- Press REALVIEW OPTIONS icon  to display camera setup and guidance options
- Press the left or right section of the guidance bar to change the selectable job information

Figure 7-9: Guidance Screen Options

### Navigation Activity & Boom Status



### RealView Options\*



### Navigation and Guidance Options\*



Zoom In/Out Icon not available on Matrix Pro 840G

\* Simulated screen example to show all possibilities.

- Home/Job Screen (or press Home Button)
- Unit Setup
- Vehicle View Guidance
- Field View Guidance
- RealView Guidance

OVERVIEW

POWER

INTRODUCTION

HOME

FULL SCREEN

SETUP

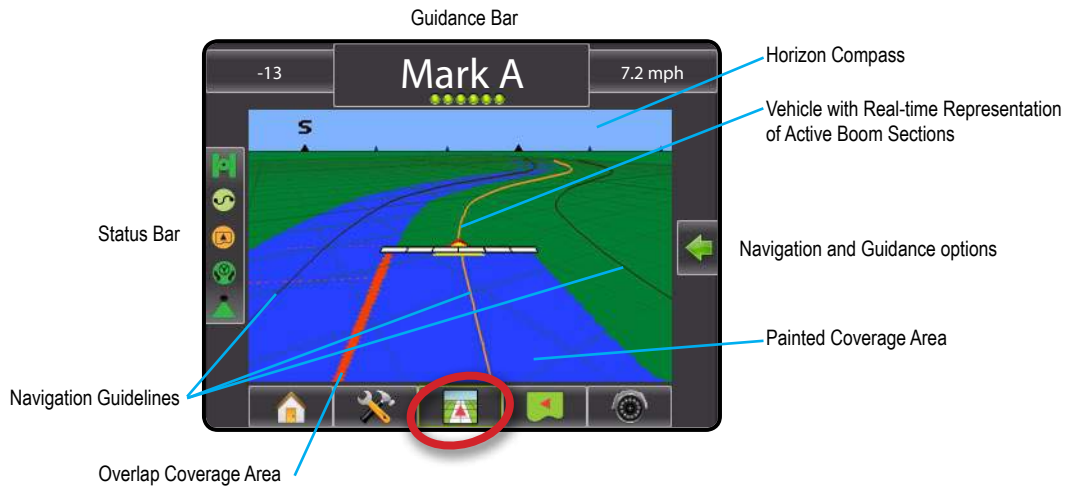
**GUIDANCE**

APPENDIX

 **Vehicle View**

Vehicle View creates a computer-generated image of the vehicle position displayed in the application area. From this screen all setup and navigation options can be accessed via the icons in the bottom and right side of the screen.

Figure 7-10: Vehicle View






**On Screen Guidance**

- Guidelines
  - ▶ Orange Line – active guidance line
  - ▶ Black Lines – adjacent guidance lines
- Points – markers for established points
  - ▶ Red Point – Return to Point
  - ▶ Blue Point – Mark A
  - ▶ Green Point – Mark B
- Horizon Compass – general heading can be displayed on horizon (when zoomed in)
- Coverage Area – illustrates applied area and overlap:
  - ▶ Blue – one application
  - ▶ Red – two or more applications

- Zoom In/Out & Perspective – adjusts the vehicle’s view or perspective to the horizon from vehicle view to bird’s eye view.
- Boom Sections
  - ▶ Hollow boxes – inactive booms
  - ▶ White boxes – active booms

**Matrix Pro 840G Console Button Assistance**

- Zoom In/Out & Perspective – the Up/Down Buttons   adjust the vehicle’s view or perspective to the horizon from vehicle view to bird’s eye view.
- Home/Job Screen – the Home button  accesses the Home/Job screen.

To access the Vehicle View screen:

1. Press VEHICLE VIEW GUIDANCE icon .

Figure 7-11: Vehicle View w/ Common Icons Shown



## Field View

Field View creates a computer-generated image of the vehicle position and application area from an aerial perspective. From this screen one can access options for boundary areas and a marked point or enter World View and Pan modes.

Figure 7-12: Field View



### On Screen Guidance

- Guidelines
  - ▶ Orange – active guidance line
  - ▶ Black – boundary line
- Points – markers for established points
  - ▶ Red Point – Return to Point
  - ▶ Blue Point – Mark A
  - ▶ Green Point – Mark B
- Coverage Area – illustrates applied area and overlap:
  - ▶ Blue – one application
  - ▶ Red – two or more applications
- Pan – adjust the map's visible area without moving the vehicle.
- Zoom In/Out – adjust the map's visible area.

### Matrix Pro 840G Console Button Assistance

- Zoom In/Out – the Up/Down Buttons ▲ ▼ adjust the map's visible area.
- Home/Job Screen – the Home/ the Home button 🏠 accesses the Home/Job screen.

To access the Field View screen:

1. Press FIELD VIEW GUIDANCE icon 📍.

Figure 7-13: Field View w/ Common Icons Shown





## RealView Guidance

RealView Guidance allows live video input to be displayed instead of a computer-generated image.

If a Video Selection Module (VSM) is installed on the system, two video options are available:

- One Camera View – one of up to eight camera inputs can be selected to change the view of the video input.
- Split Camera View – one of two sets of four camera inputs (A/B/C/D or E/F/G/H) can be selected to divide the screen into four separate video feeds.

From this screen one can enter guidance over video and steering angle modes.

Figure 7-14: RealView Guidance



## On Screen Guidance

- Guidelines
  - ▶ Orange Line – active guidance line
  - ▶ Black Lines – adjacent guidance lines

To access the RealView screen:

1. Press REALVIEW GUIDANCE icon

Figure 7-15: Real View w/ Common Icons Shown



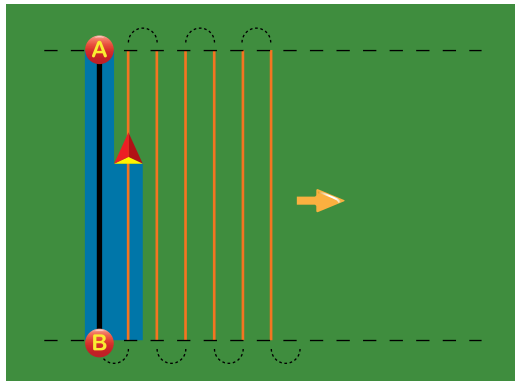
## GUIDANCE MODES

Guidance Modes include: Straight AB, Curved AB, Circle Pivot, Last Pass and NextRow as well as the Next Guideline options: Next Straight AB, Next Curved AB and Next Circle Pivot.

### Straight AB Guidance

Straight AB guidance provides straight line guidance based on A and B reference points. The original A and B points are used to calculate all other parallel guidelines.

*NOTE: Offset to adjacent guidelines will be calculated using the guidance width, which is encoded in Unit Setup in the Implement menu.*







1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press GUIDANCE MODE icon .
3. Select STRAIGHT AB GUIDANCE icon .
  - ◀ Status Bar Icon will change to .

Figure 7-16: Straight AB Guidance



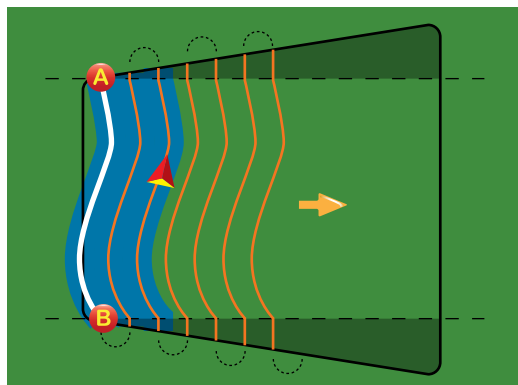
 **Curved AB Guidance**

Curved AB Guidance provides guidance along curved lines based on an initial AB reference line. This initial baseline is used to calculate all other guidelines.

*NOTE: Curved guidance is recommended not to exceed 30° within the AB guideline.*

*Offset to adjacent guidelines will be calculated using the guidance width, which is encoded in Unit Setup in the Implement menu.*

*HINT: Start on the longest curve of the field. While working in a bounded area, the guidance pattern extending beyond the established AB points will be straight line guidance.*







1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press GUIDANCE MODE icon .
3. Select CURVED AB GUIDANCE icon .
  - ◀ Status Bar Icon will change to .

Figure 7-17: Curved AB Guidance

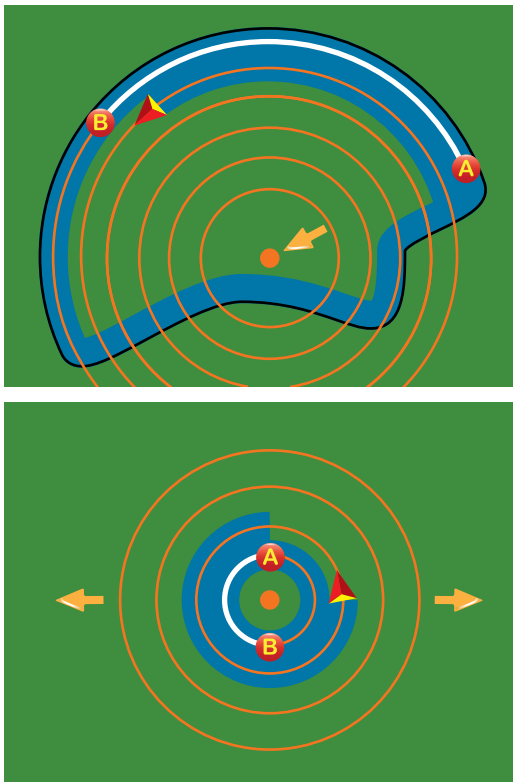


## Circle Pivot Guidance

Circle Pivot guidance provides guidance around a central location that radiates inward or outward based on an initial AB reference line. This initial baseline is used to calculate all other guidelines.

It is used for product application in a center pivot field while being guided along a circular guideline that matches a center pivot irrigation system radius.

*NOTE: Offset to adjacent guidelines will be calculated using the guidance width, which is encoded in Unit Setup in the Implement menu.*







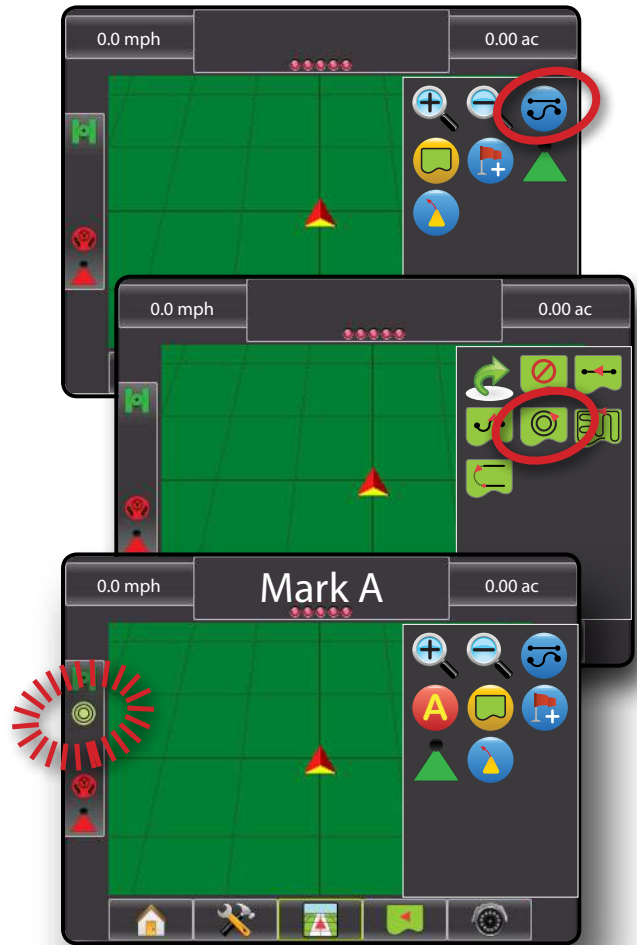
1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press GUIDANCE MODE icon .
3. Select CIRCLE PIVOT GUIDANCE icon .
  - ◀ Status Bar Icon will change to 

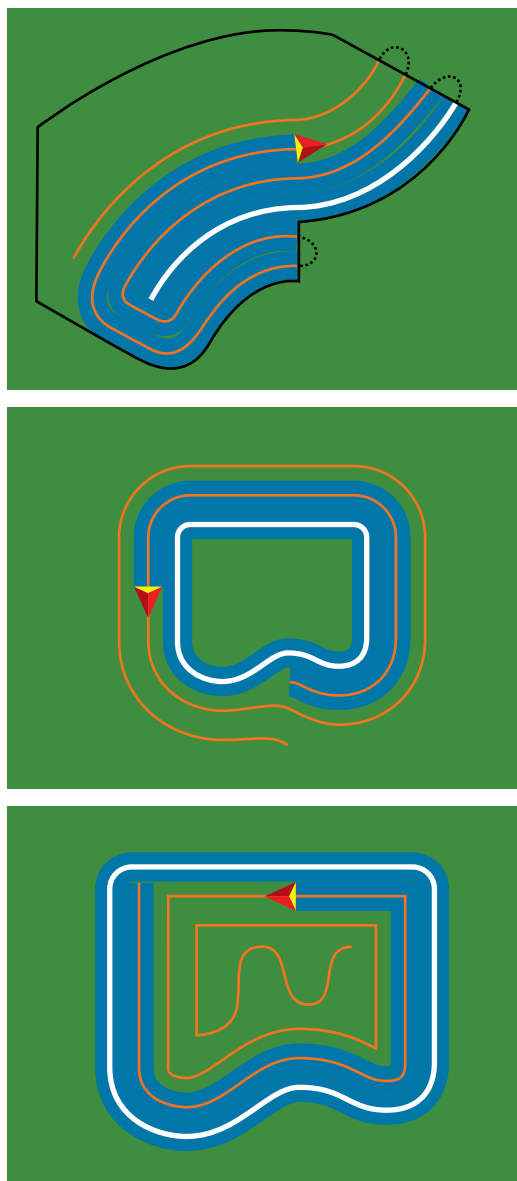
Figure 7-18: Circle Pivot Guidance



 **Last Pass Guidance**

Last Pass Guidance offers true last pass navigation. The console will automatically detect the nearest “applied” guideline and establish adjacent pass based on that guideline.

*NOTE: If a boundary is established but no application occurred during the boundary process, guidance will not initiate.*







1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press GUIDANCE MODE icon .
3. Select LAST PASS GUIDANCE icon .
  - ◀ Status Bar Icon will change to .

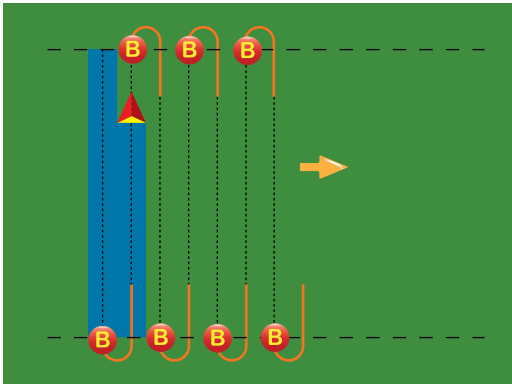
Figure 7-19: Last Pass Guidance



**NextRow Guidance**

NextRow Guidance indicates where the NextRow is located and provides guidance at row ends to the next adjacent row. When the operator marks the end of the row and begins turning to the next row, a Straight AB guidance line is provided in the next row. When the vehicle is in the NextRow, guidance is turned off.

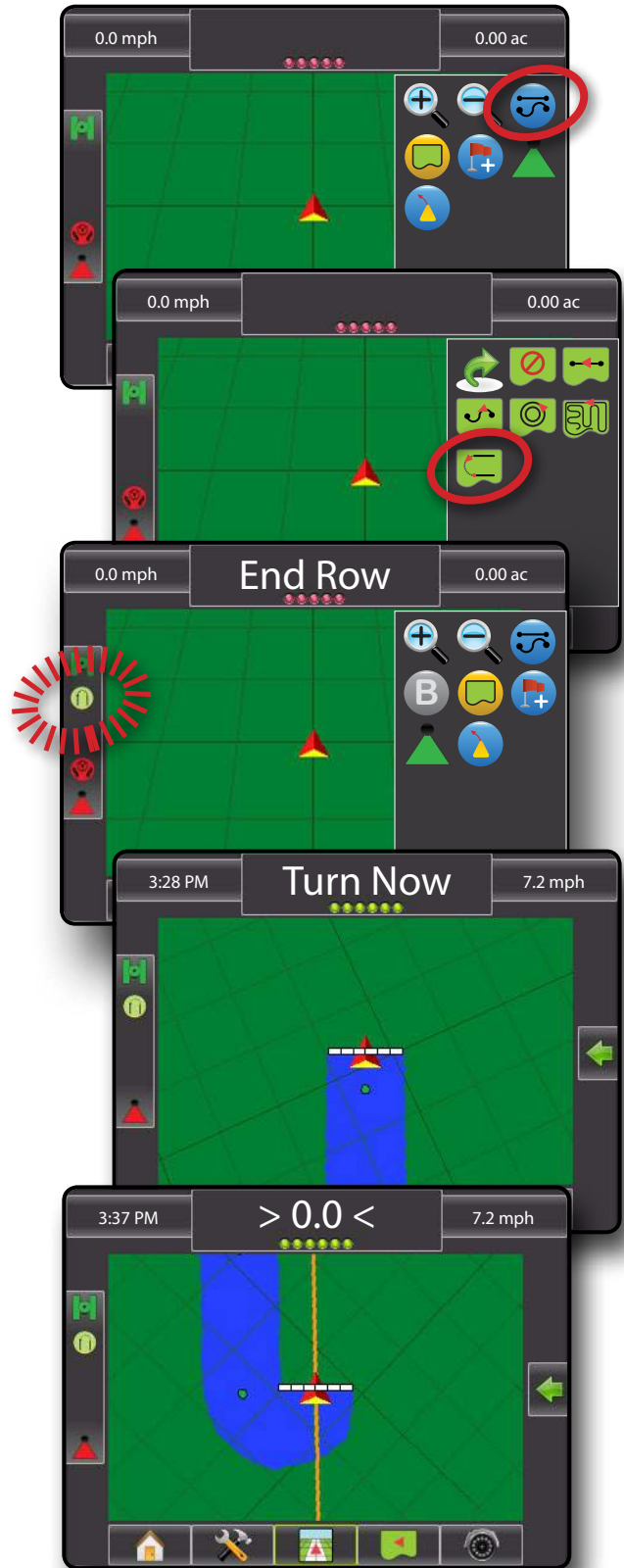
*NOTE: Offset to adjacent guidelines will be calculated using the guidance width, which is encoded in Unit Setup in the Implement menu.*



1. Press NAVIGATION AND GUIDANCE OPTIONS icon to display navigation options.
2. Press GUIDANCE MODE icon .
3. Select NEXTROW GUIDANCE icon .
  - ◀ Status Bar Icon will change to and the Mark A point will automatically be marked

*NOTE: The NextRow Guidance does not support skipping rows.*

Figure 7-20: NextRow Guidance



 **No Guidance**

No Guidance turns off guidance.

*NOTE: No Guidance Mode does not delete established guide lines or points from the console. To delete established/saved data from the console, please refer to the Data Management section under Unit Setup.*




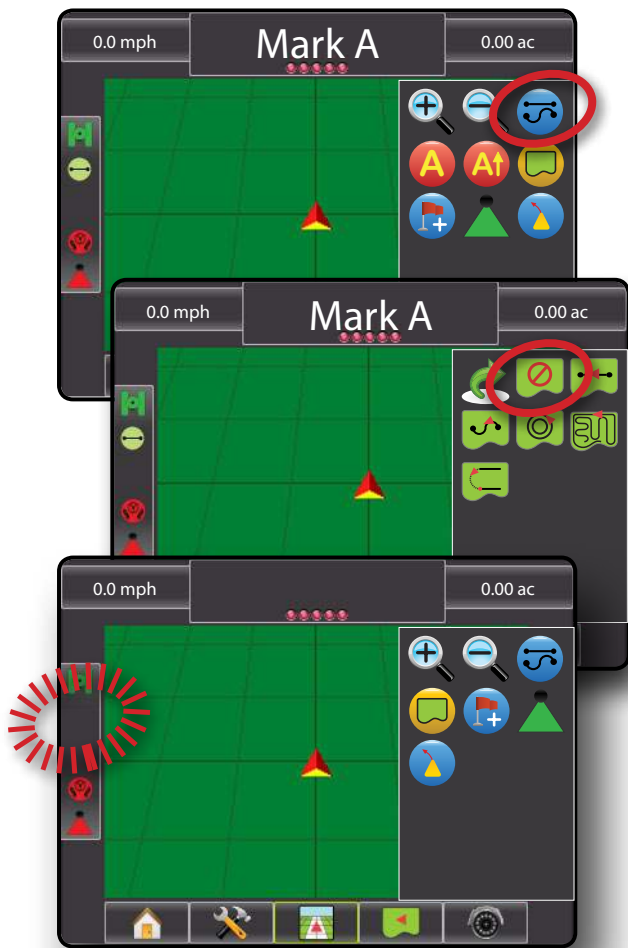

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
  2. Press GUIDANCE MODE icon .
  3. Select NO GUIDANCE icon .
- ◀ Status Bar will have no icon




Figure 7-21: No Guidance



GUIDELINES

Curved Lookahead  indicates what direction the vehicle will take when steering in any given direction.

AB guidelines, Azimuth guidelines, next pass guidelines and NextRow guidelines are each available depending on the current guidance mode. Up to 25 established guidelines are stored in the console per job. Switching from one guidance mode to another will change the current available guidelines.



Multiple guidelines can be created in each guidance mode. If more than one guideline is saved in a single guidance mode, the Next Guideline feature will become available. By pressing the Next Guideline    option, the vehicle will be directed to the next guideline saved in the console.

A user can duplicate and edit jobs for reuse of boundaries and guidelines for different applications over the same field using Fieldware Link or the Data->Manage Data option.

 **Curved Lookahead Guideline**

The curved lookahead guideline provides an indication of where the current steering will take the vehicle using a 'pointer' as guidance. The Curved Lookahead option is available in all guidance modes.

To activate the Curved Lookahead guideline:



1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Select CURVED LOOKAHEAD icon 

The pointer will be visible on the navigation screen.

Figure 7-22: Curved Lookahead



To remove the Curved Lookahead guideline:






1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Select CURVED LOOKAHEAD icon 

 **Straight AB Guidelines**

Straight AB guidance provides straight line guidance based on A and B reference points. The original A and B points are used to calculate all other parallel guidelines based on the programmed guidance width.

*Marking A and B Points*


To establish an AB guideline:


1. Drive to the desired location of Point A .
2. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
3. **While the vehicle is in motion**, press MARK A icon .
4. Drive to the desired location of Point B .
5. Press MARK B icon  to establish the AB line.
6. "Would you like to name this guideline?"

Press:

- ▶ Yes – to enter a name and save the guideline in the console
- ▶ No – to automatically generate a name and save the guideline in the console

The console will begin providing navigation information.

*NOTE: The MARK B icon  is not available for selection (greyed out) until the minimum distance is travelled (9.84 feet / 3.0 meter).*

Use CANCEL MARK icon  to cancel the Mark A command and revert to the previous straight AB guideline (when established).

To establish additional straight AB guidelines, follow the same steps as the initial straight AB guideline. To toggle between straight AB guidelines, see "Next Straight AB Guideline Feature".

Figure 7-23: Mark A Point



Figure 7-24: Mark B Point



Figure 7-25: Save Guideline

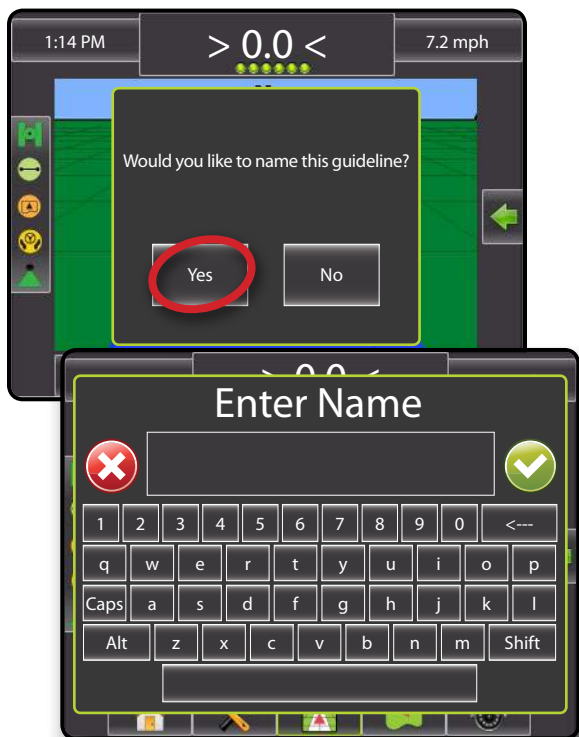
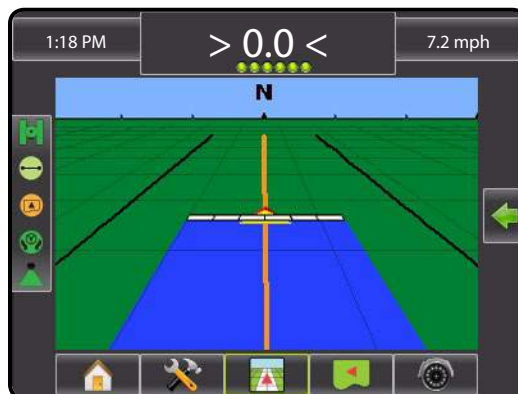


Figure 7-26: Follow Guidance



### A+ Nudge Feature

The A+ Nudge feature allows the current straight AB guideline to be shifted to the vehicle's current location.



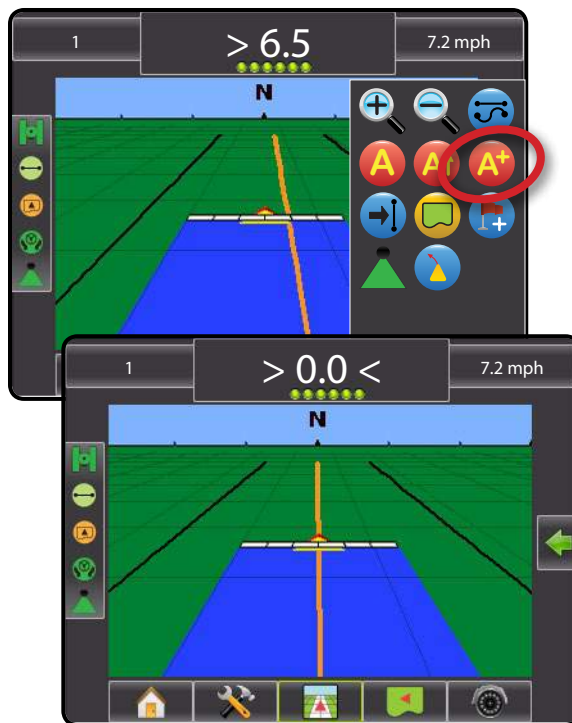



1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press A+ NUDGE icon .


Figure 7-27: A+ Nudge



**Next Straight AB Guideline Feature**

If more than one straight AB guideline is saved, the Next Straight Guideline feature will become available. By pressing the Next Straight Guideline icon  option, the vehicle will be directed to the next straight AB guideline saved in the console.

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press NEXT STRAIGHT AB GUIDELINE icon .

Toggle between all guidelines by pressing the NEXT STRAIGHT GUIDELINE icon  again.

*NOTE: If no straight AB guideline or only one straight AB guideline is saved in the console, the Next Straight Guideline icon will not be displayed.*

Figure 7-28: Next Guideline



To view which guideline is active, press the Guidance Mode icon on the Status Bar.





Figure 7-29: View Which Guideline is Active



**Azimuth Degree**

An azimuth is defined as a horizontal angle measured clockwise from a north base line. When using an azimuth, the point from which the azimuth originates is the center of an imaginary circle. This circle is divided into 360°. North = 0, East = 90, South = 180, West = 270.

An azimuth degree can be entered to determine the exact location of the vehicle. When a navigation mode is selected, the azimuth degree can be entered.

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press AZIMUTH icon  to enter azimuth degree.
3. Use the entry screen to establish the Azimuth degree.
4. Press:
  - ▶ Accept  to save the settings
  - ▶ Cancel  to leave the keypad without saving
5. "Would you like to name this guideline?"
  - ▶ Yes – to enter a name and save the guideline
  - ▶ No – to automatically generate a name

The console will begin providing navigation information.

To establish additional azimuth guidelines, follow the same steps as the initial azimuth guideline.

Figure 7-30: Azimuth Guidance



Figure 7-31: Save Guideline

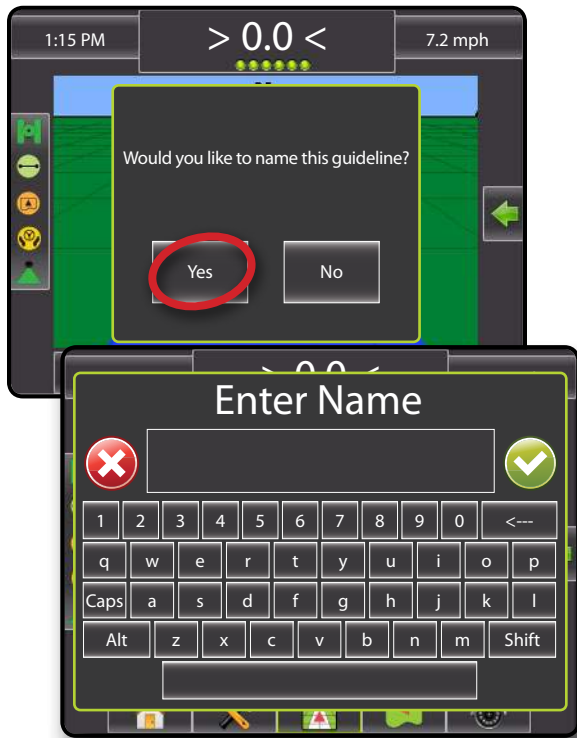
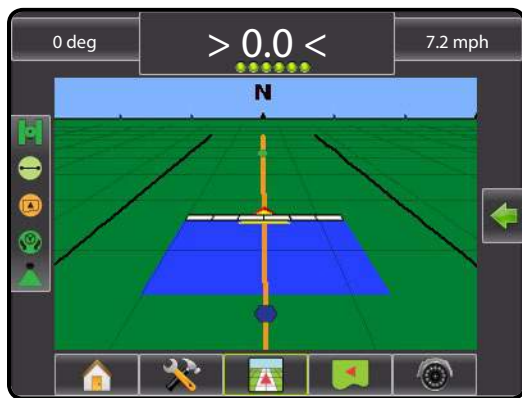


Figure 7-32: Follow Guidance








### Curved AB Guidelines

Curved AB Guidance provides guidance along curved lines based on an initial AB reference line. This initial baseline is used to calculate all other guidelines based on the programmed guidance width.

#### Marking A and B Points


To establish an AB guideline:


1. Drive to the desired location of Point A .
2. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
3. **While the vehicle is in motion**, press MARK A icon .
4. Following the path of the intended reference line, drive to the desired location of Point B .
5. Press MARK B icon  to establish the AB line.
6. "Would you like to name this guideline?"

Press:

- ▶ Yes – to enter a name and save the guideline in the console
- ▶ No – to automatically generate a name and save the guideline in the console

The console will begin providing navigation information.

*NOTE: The MARK B icon  is not available for selection (greyed out) until the minimum distance is travelled (9.84 feet / 3.0 meter).*

Use CANCEL MARK icon  to cancel the Mark A command and revert to the previous curved AB guideline (when established).

To establish additional curved AB guidelines, follow the same steps as the initial curved AB guideline. To toggle between curved AB guidelines, see "Next Curved AB Guideline Feature".

Figure 7-33: Mark A Point



Figure 7-34: Mark B Point



Figure 7-35: Save Guideline

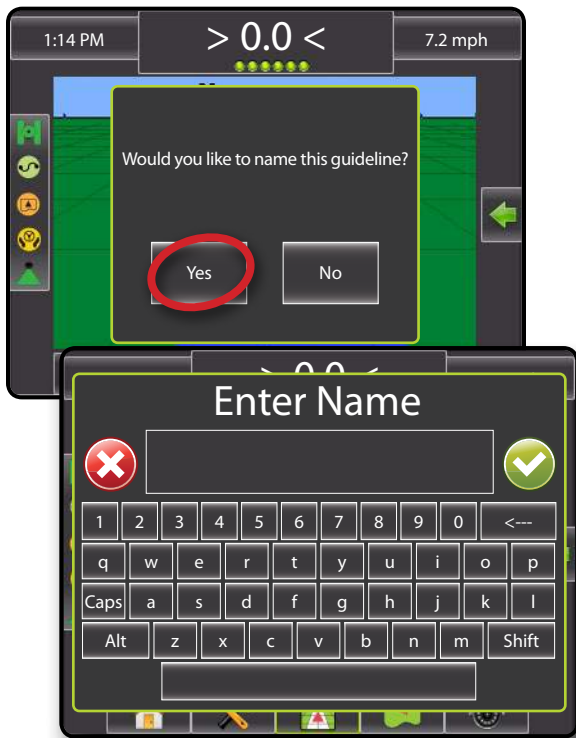


Figure 7-36: Follow Guidance



### A+ Nudge Feature

The A+ Nudge feature allows the current curved AB guideline to be shifted to the vehicle's current location.



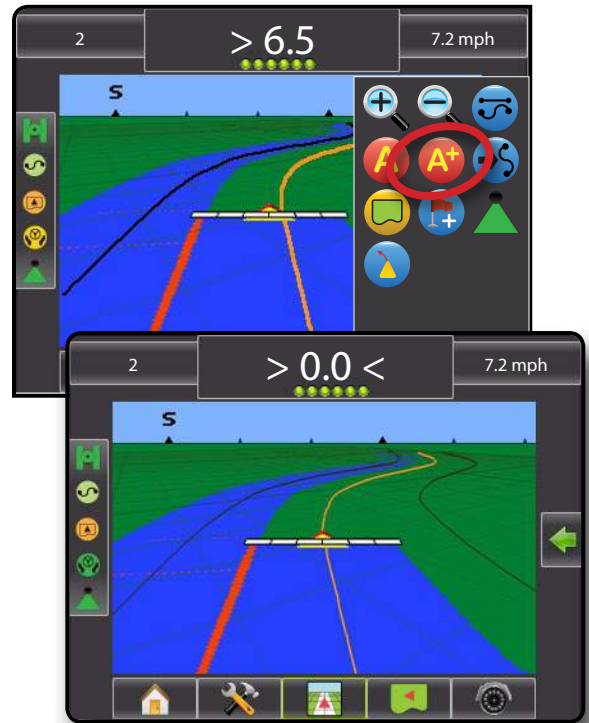



1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press A+ NUDGE icon .


Figure 7-37: A+ Nudge



### Next Curved Guideline Feature

If more than one curved AB guideline is saved, the Next Curved Guideline feature will become available. By pressing the Next Curved Guideline  option, the vehicle will be directed to the next curved AB guideline saved in the console.

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press NEXT CURVED AB GUIDELINE icon .

Toggle between all guidelines by pressing the NEXT CURVED GUIDELINE icon  again.

**NOTE:** If no curved AB guideline or only one curved AB guideline is saved in the console, the Next Curved Guideline icon will not be displayed.

Figure 7-38: Next Guideline



To view which guideline is active, press the Guidance Mode icon on the Status Bar.

Figure 7-39: View Which Guideline is Active








### Circle Pivot Guidelines

Circle Pivot guidance provides guidance around a central location that radiates inward or outward based on an initial AB reference line. This initial baseline is used to calculate all other guidelines based on the programmed guidance width.

#### Marking A and B Points


To establish an AB guideline:

1. Drive to the desired location of Point A .
2. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
3. **While the vehicle is in motion**, press MARK A icon .
4. Drive along the arc that the pivot would create (a wheel track is a good guide) to the desired location of Point B .
5. Press MARK B icon  to establish the AB line.
6. "Would you like to name this guideline?"

Press:

- ▶ Yes – to enter a name and save the guideline in the console
- ▶ No – to automatically generate a name and save the guideline in the console

The console will begin providing navigation information.

**NOTE:** The MARK B icon  is not available for selection (greyed out) until the minimum distance is travelled (164.0 feet / 50.0 meter) or if driving in a straight line.

**NOTE:** It is not necessary to drive the entire circumference of the center pivot in order to initiate guidance.


Use CANCEL MARK icon  to cancel the Mark A command and revert to the previous circle pivot guideline (when established).

Figure 7-40: Mark A Point



Figure 7-41: Mark B Point



Figure 7-42: Save Guideline

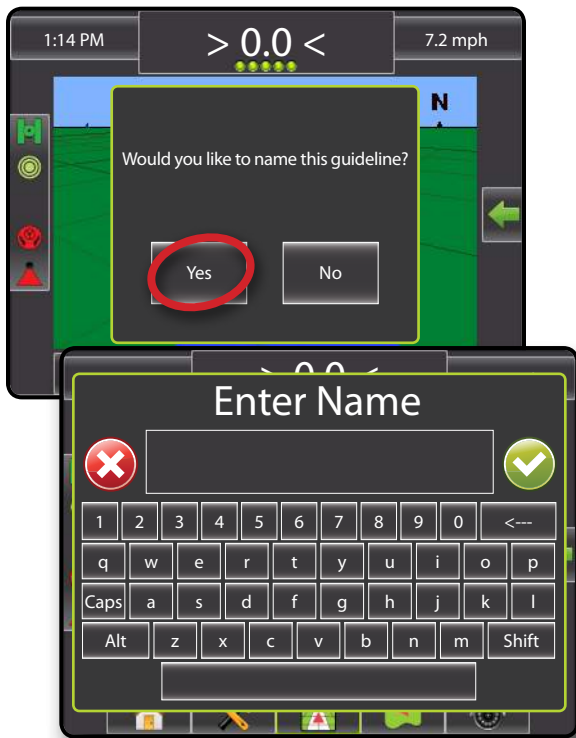
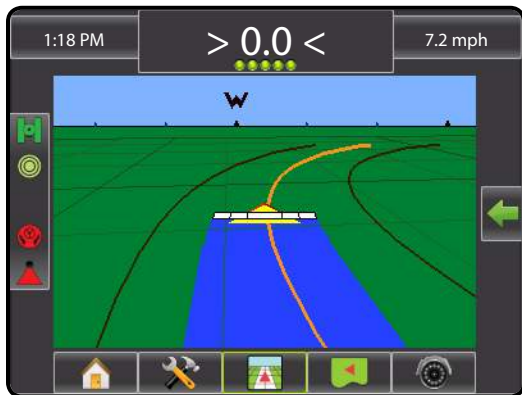


Figure 7-43: Follow Guidance



### A+ Nudge Feature

The A+ Nudge feature allows the current circle pivot guideline to be shifted to the vehicle's current location.






1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press A+ NUDGE icon .


Figure 7-44: A+ Nudge



### Next Guideline Feature

If more than one circle pivot guideline is saved, the Next Circle Pivot Guideline feature will become available. By pressing the Next Circle Pivot Guideline  option, the vehicle will be directed to the next circle pivot guideline saved in the console.

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press NEXT CIRCLE PIVOT GUIDELINE icon .

Toggle between all guidelines by pressing the NEXT CIRCLE PIVOT GUIDELINE icon  again.

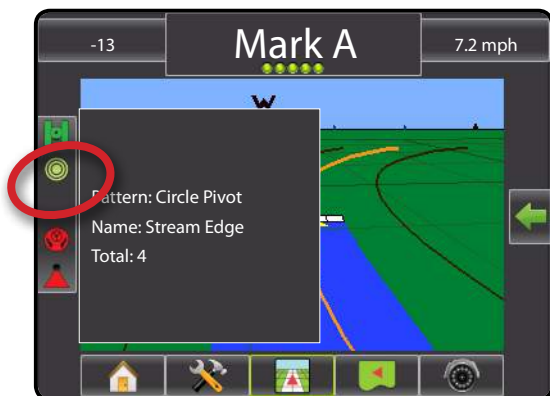
**NOTE:** If no circle pivot guideline or only one circle pivot guideline is saved in the console, the Next Circle Pivot Guideline icon will not be displayed.

Figure 7-45: Next Guideline



To view which guideline is active, press the Guidance Mode icon on the Status Bar.

Figure 7-46: View Which Guideline is Active



### Last Pass Guidelines

Last Pass Guidance offers true last pass navigation. The console will automatically detect the nearest applied area and establish parallel guideline based on that area.

To activate Last Pass Guidance:

1. Drive to a desired location to apply the first pass.
2. Travel next to the applied area.
3. The console will begin providing navigation information.

**NOTE:** If a boundary is established but no application occurred during the boundary process, guidance will not initiate.

Figure 7-47: Apply First Pass

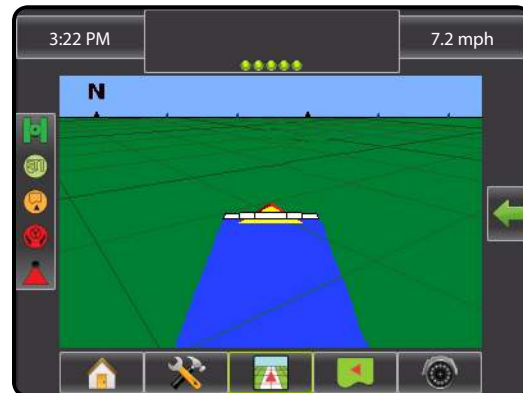
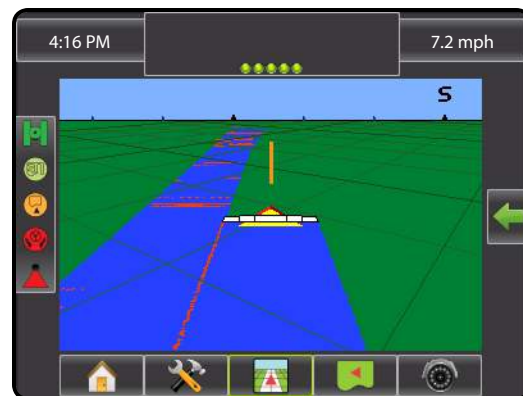



Figure 7-48: Follow Guidance



**NextRow Guidelines**

NextRow Guidance indicates where the next row is located based on the programmed guidance width and provides guidance at user marked row ends to the next adjacent row. When the operator signals the end of the row, a Straight AB line will be established in the current row and guidance is provided to the NextRow. When the vehicle is in the NextRow, guidance is turned off.

To activate NextRow Guidance:

1. At the end of a row (while driving a straight line) press MARK B **B**.
  - ▶ The end of the row will be marked with a green point .
2. Turn toward the next row.
3. Based on that direction turned, guidance will be provided for the next adjacent row.
  - ▶ When the vehicle is in the row, the guideline is removed
4. Repeat at the end of the next row.

*NOTE: The NextRow Guidance feature does not support skipping rows.*

Figure 7-49: Mark End of Row

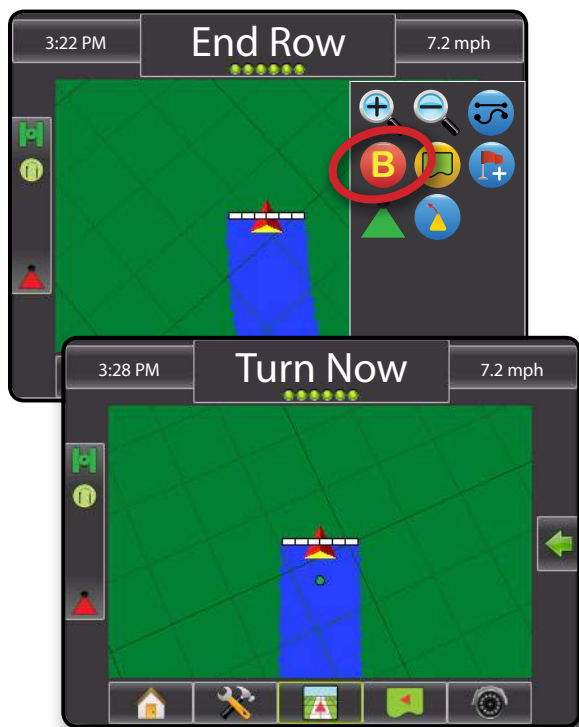


Figure 7-50: Turn to Next Row



Figure 7-51: Follow Guidance



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## APPLICATION BOUNDARY

Application boundaries establish areas where application is and is not applied while using ABSC or BoomPilot. Boundaries can be established in all guidance modes. One exterior boundary and up to five (5) interior boundaries can be stored at one time.



Using Data->Manage Data or with Fieldware Link, a user can duplicate and edit jobs for reuse of boundaries and guidelines for different applications over the same field.

To establish an exterior application boundary:

1. Drive to a desired location at the perimeter of the field/application area.
2. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
3. While the vehicle is in motion, press BOUNDARY icon .
4. Travel the perimeter of the field/area.
5. Finish boundary:
  - ▶ Travel to within one swath width of the starting point. The boundary will close automatically (the white guideline will turn black)
  - ▶ Press BOUNDARY FINISH icon . A straight line will complete the boundary between your current location and the starting point
6. Press:
  - ▶ Save – to save the boundary
  - ▶ Delete – to delete the boundary

**NOTE:** On the external or initial boundary, the BOUNDARY FINISH icon  is not available for selection (grayed out) until the minimum distance is travelled (five-times the swath width).

If mapping a boundary with one or more booms folded in and turned off, it is necessary to maintain this boom configuration for the duration of the boundary pass. Any changes made to the number of booms turned on, and therefore the width of the machine after the boundary mapping process has started, will result in the application mapping the boundary at the outer edge of all the programmed booms – not necessarily those turned on at any given point in time during the boundary pass .

When mapping a boundary with some booms turned off, it is necessary to turn BoomPilot to Manual mode  and turn ON the Master and Boom switches for all booms that will be used during the Boundary pass. Once the boundary pass is complete the Boom switches can be turned OFF, Master switch remains ON, BoomPilot can be returned to Automatic mode  and automatic boom section control can then be used.


**Note:** If a boundary is mapped with some booms folded as described above, it may be necessary to use the A+ NUDGE icon  on the guideline over to the correct position for subsequent passes in the field.

Figure 7-52: Boundary in Progress

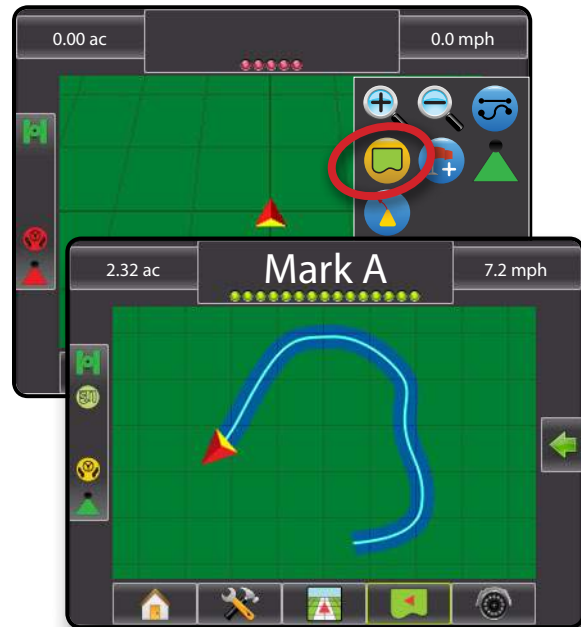


Figure 7-53: Finish Boundary – Straight line to starting point



Figure 7-54: Finish Boundary – Travel to starting point



Figure 7-55: Save Boundary



Use CANCEL BOUNDARY icon  to cancel the new field boundary process and revert to the previous boundary (when established).

To establish one or more interior boundaries, follow the same steps as the initial boundary.

Figure 7-56: Add Interior Boundary



While creating an external or initial boundary, the boundary line will be to the exterior of the outer most active boom section. While creating an interior or additional boundary, the boundary line will be to the interior of the inner most active boom section.

Use DELETE BOUNDARY icon  to delete all field boundaries for the current job.

Figure 7-57: Finish Boundary – Travel to starting point





In correspondence to your current location, the IN BOUNDARY icon  or OUT BOUNDARY icon  is displayed on the Status Bar once the boundary is established.

Figure 7-58: Finish Boundary – Travel to starting point



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## 1+ RETURN TO POINT

Return to Point provides guidance back to an established point in Vehicle View and Field View. In Vehicle View an arrow directs the vehicle back to the established point. In Field View only the point is displayed.

A return point is not job specific and will remain active until canceled.

### Marking a Return Point

To mark a return point:




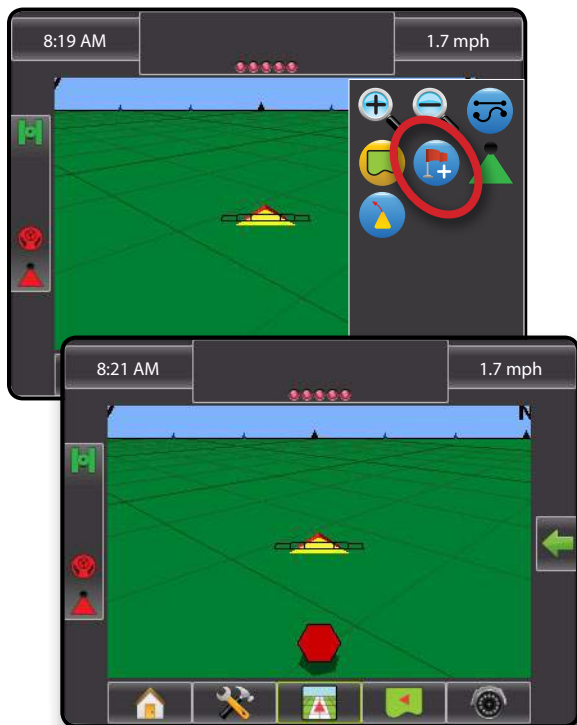


1. Drive to the desired location of Return Point .
2. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
3. Press ADD POINT icon .

Figure 7-59: Return Point Established – Vehicle View



### Guidance to a Return Point

To show distance and guidance to the established point:

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press the RETURN TO POINT GUIDANCE icon .

The console will begin providing the distance information on the Guidance Bar from the vehicle to the established point.

Figure 7-60: Return to Point Guidance – Vehicle View




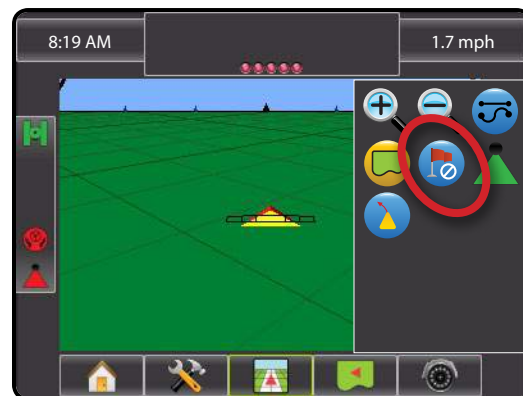



Use CANCEL RETURN TO POINT icon  to stop guidance and delete the established point.



Figure 7-61: Cancel Return to Point Guidance



## BOOMPILOT

### SmartCable or SDM

If a SmartCable or Section Driver Module (SDM) is present, BoomPilot is used to set BoomPilot to Off/Manual , Automatic  or All On .


*NOTE: GPS is unavailable when the BOOMPILOT icon is grey . BoomPilot status bar icon will be Off/Manual .*



*If a SmartCable or Section Driver Module (SDM) is not present, please refer to Single Section to view example.*


*If Work On/Off Switch is in the “On” position, improper application may occur.*

*If the individual boom section switches are in the “On” position, BoomPilot application control will not control those sections.*

### Off/Manual & Automatic

To switch BoomPilot between off/manual  and automatic :

1. Work On/Off Switch should remain in the “Off” position.
2. Turn the controller master switch to the “On” position. The individual boom section switches should remain in the “Off” position.
3. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
4. Press BOOMPILOT icon .

◀Off/Manual – Status Bar Icon will change to red 

◀Automatic – Status Bar Icon will change to green 

In areas where application is not desired:

◀Manually turn “off” the rate controller master switch to shut off the booms. Turn the master switch “on” to resume application.

◀Press BOOMPILOT icon . Press the BOOMPILOT icon  again to resume application.

### All Sections On Mode

To turn all sections on :

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press and hold BOOMPILOT icon .


◀All On – Status Bar Icon will change to yellow 

Figure 7-62: Automatic to All Sections On Mode





## Single Section


If a SmartCable or Section Driver Module (SDM) is not present, BoomPilot is used to turn all booms on or off. BoomPilot can be overridden by using the Work On/Off Switch. Only one Boom Section width will be illustrated and the Status Bar will have no icon.


**NOTE:** GPS is unavailable when the BOOMPILOT icon is grey ▲.

*If a SmartCable or Section Driver Module (SDM) is present, please refer to SmartCable or SDM Section for more information.*

To switch application off or on using the console:

1. Work On/Off Switch should remain in the "Off" position.
2. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
3. Press BOOMPILOT icon .

**NOTE:** If the Work On/Off Switch is in the "On" position, the entire section will be activate and the BOOMPILOT icon  will have no affect.

*If the Work On/Off Switch is not present on the system, the BOOMPILOT icon  will control the application on/off functions.*

In areas where application is not desired:



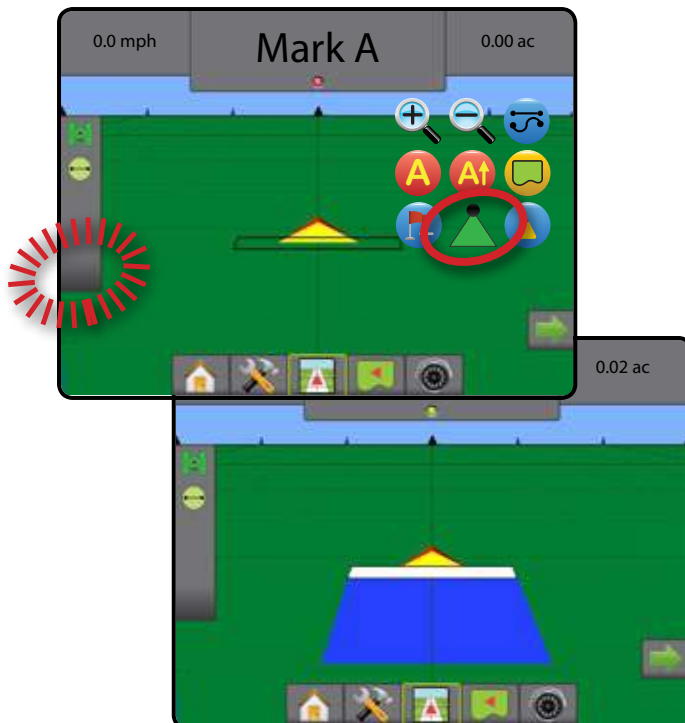
- ◀ Press BOOMPILOT icon . Press the BOOMPILOT icon  again to resume application.
- ◀ Turn the Work On/Off Switch to the "On" position and back to the "Off" position. Turn the Work On/Off Switch "on" to resume application.

Figure 7-63: All Booms Off/On – No SDM



## ZOOM IN/OUT

### Vehicle View

Zoom In/Out & Perspective is used to adjust the vehicle's view or perspective to the horizon from vehicle view to bird's eye view.





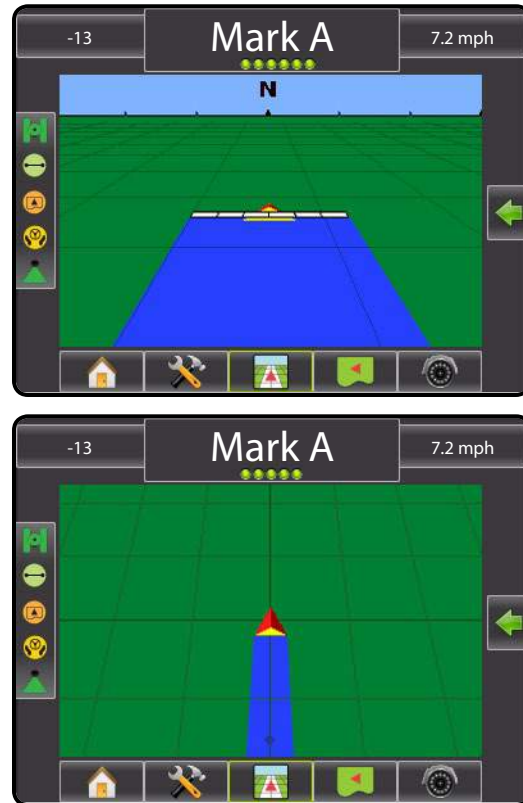



- Zoom in   will adjust view to vehicle view displaying a compass on the horizon
- Zoom out   will adjust view to bird's eye view

Figure 7-64: Zoom In to Zoom Out



**Matrix Pro 570G**

To adjust the view or perspective:

1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
2. Press ZOOM IN/OUT icons  .



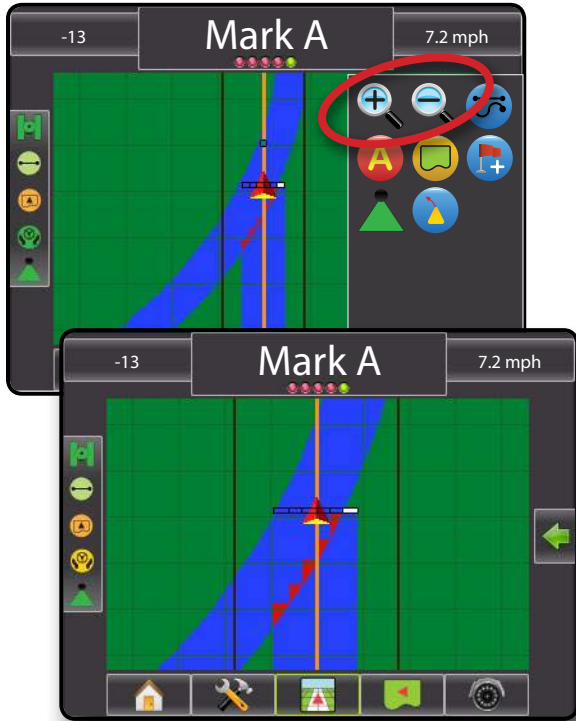




NOTE: Press & hold ZOOM IN/OUT icons   to quickly adjust settings.

Figure 7-65: Zoom In and Out Icons








**Field View**

Zoom In/Out is used to adjust the map's visible area.

- Zoom in   will decrease the amount of map area visible
- Zoom out   will increase the amount of map area visible

**Matrix Pro 570G**

To adjust the view:

1. Press the screen to activate pan mode.
  2. Press ZOOM IN/OUT icons  .
- OR
1. Press NAVIGATION AND GUIDANCE OPTIONS icon  to display navigation options.
  2. Press ZOOM IN/OUT icons  .



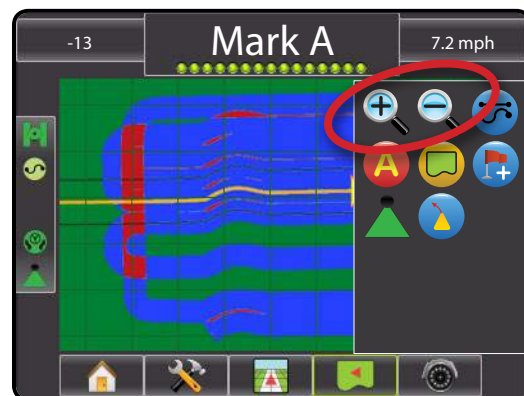
NOTE: Press & hold ZOOM IN/OUT icons   to quickly adjust settings.

Figure 7-67: Zoom In and Out Icons in Pan Mode





Figure 7-68: Zoom In and Out Icons from Navigation & Guidance Options



**Matrix Pro 840G**

To adjust the view or perspective:

1. Press ZOOM IN/OUT buttons  .



NOTE: Press & hold ZOOM IN/OUT buttons   to quickly adjust settings.

Figure 7-66: Zoom In and Out Buttons



## Matrix Pro 840G

To adjust the view:

1. Press ZOOM IN/OUT buttons ▲ ▼.

*NOTE: Press & hold ZOOM IN/OUT buttons ▲ ▼ to quickly adjust settings.*

Figure 7-69: Zoom In and Out Buttons



## PAN MODE

While in Field View Guidance, the pan mode allows the screen to be positioned manually as desired.

To enter pan mode and pan across the screen:

1. Press the screen to activate arrows and world icon.
2. Press ARROWS ↓←→↑ in the corresponding direction to move the view on screen (down, left, right, up).

*NOTE: Press WORLD VIEW icon 🌐 to center vehicle on screen and extend the screen view to the widest area available.*

*NOTE: Press & hold ARROWS ↓←→↑ to quickly adjust settings.*

To exit Pan Mode:

1. Tap the screen.

Figure 7-70: Pan Mode



## REALVIEW SPECIFIC OPTIONS

RealView Guidance allows live video input to be displayed instead of a computer-generated image.

If a Video Selection Module (VSM) is installed on the system, two (2) video options are available:

- Single Camera View – one (1) of up to eight (8) camera inputs can be selected to change the view of the video input.
- Split Camera View – one (1) of two (2) sets of four (4) camera inputs (A/B/C/D or E/F/G/H) can be selected to divide the screen into four separate video feeds.

RealView Guidance options also include guidance over video and a steering angle indicator.

Figure 7-71: RealView Options



## VSM Not Installed



If a VSM is not installed, the VIDEO icon  and SPLIT VIEW icon  are not available and only one (1) video feed will be available. Guidance over video and a steering angle indicator will still be available under the RealView setup options.

Figure 7-72: VSM Not Installed



## Inactive Camera Port

When a selected camera feed is not available, a blue screen with the TeeJet logo will fill the screen on that port's screen quarter.

Figure 7-73: Inactive Camera Ports



## Single Camera Selection

One (1) of up to eight (8) camera views can be activated in RealView Guidance if a Video Selection Module (VSM) is attached.

When an eight (8) channel VSM is on the system, up to eight (8) cameras can be installed. When a four (4) channel VSM is on the system, up to four (4) cameras can be installed.

To change the active single camera view:

1. Press REALVIEW OPTIONS icon  to display RealView options
2. Press the VIDEO icon .
3. Select the desired CAMERA , , , , , ,  or  to change the active video feed.

Figure 7-74: Camera Selection



### Split Camera View

Split Camera View allows one (1) of two (2) sets of four (4) camera inputs (A/B/C/D or E/F/G/H) to be selected to divide the screen into four (4) separate video feeds while in RealView Guidance if a Video Selection Module (VSM) is attached.

When an eight (8) channel VSM is on the system, up to eight (8) cameras can be installed. When a four (4) channel VSM is on the system, up to four (4) cameras can be installed.

To change the active set of split camera views:





1. Press REALVIEW OPTIONS icon  to display RealView options.
2. Press the SPLIT VIEW icon .
3. Select:
  - ▶ Cameras A/B/C/D 
  - ▶ Cameras E/F/G/H 

Figure 7-75: Select Split View



### RealView Setup Options

RealView setup options accesses additional guidance tools including guidance over video and a steering angle indicator.

Figure 7-76: RealView Setup Options



## Guidance Over Video

Guidance Over Video places three dimensional guidelines over the video feed for navigation assistance.

To activate Guidance Over Video:




1. Press REALVIEW OPTIONS icon  to display RealView options
2. Press REALVIEW GUIDANCE OPTIONS icon .
3. Select GUIDANCE OVER VIDEO icon .
4. To turn off guidance over video, repeat steps 1 through 3.

Figure 7-77: Guidance Over Video



## Guidance Unavailable

If guidance is not available, only a horizon line will be visible.


Guidance (Straight AB, Curved AB, Circle Pivot, NextRow or Last Pass) is setup in the navigation & guidance options .

Figure 7-78: Guidance Unavailable







## Horizon Line Adjustment

Horizon Line Adjustment is used to adjust the horizon line to match the camera's view.



*NOTE: To align guidance lines to the camera's view, the camera(s) may need to be physically adjusted.*

To adjust the horizon line:

1. Press REALVIEW OPTIONS icon  to display RealView options
2. Press REALVIEW GUIDANCE OPTIONS icon .
3. Press the UP/DOWN arrows  .

◀ Up Arrow will move the horizon line up

◀ Down Arrow will move the horizon line down

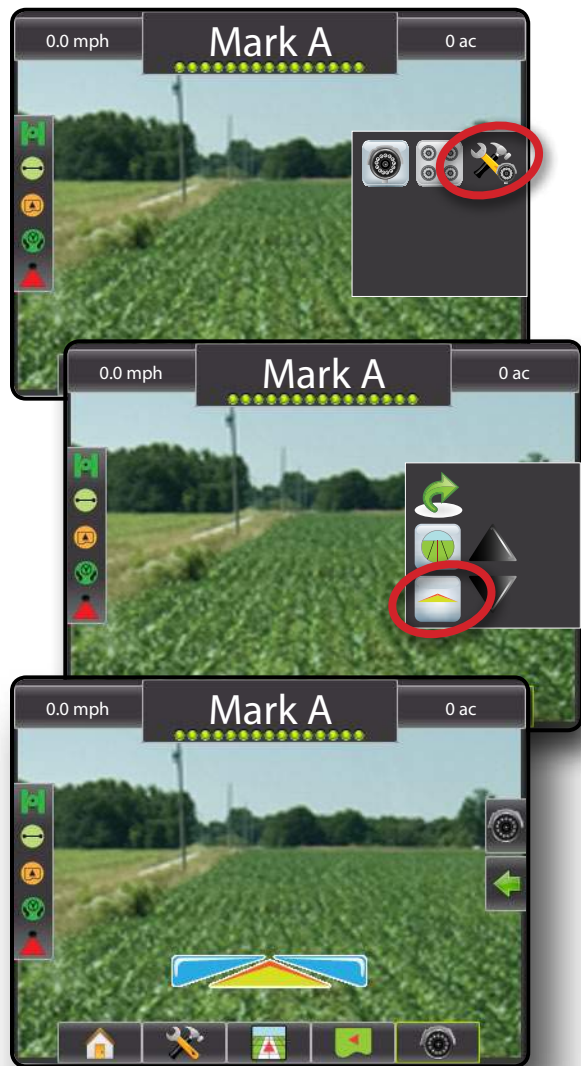
*NOTE: Press & hold UP/DOWN arrows   to quickly adjust settings.*

*NOTE: The ZOOM IN/OUT BUTTONS   will not adjust the horizon line up or down.*

Figure 7-79: Horizon Line Adjustment






Figure 7-80: Steering Angle Indicator



### Steering Angle Indicator

Steering Angle Indicator displays the direction in which the steering wheel needs to be adjusted.

To activate Steering Angle Indicator:

1. Press REALVIEW OPTIONS icon  to display RealView options
2. Press REALVIEW GUIDANCE OPTIONS icon .
3. Select STEERING ANGLE icon .
4. To turn off Steering Angle, repeat steps 1 through 3.

### Guidance Unavailable

If guidance is not available, only the vehicle indicator will be visible.


Guidance (Straight AB, Curved AB, Circle Pivot, NextRow or Last Pass) is setup in the navigation & guidance options .

Figure 7-81: Guidance Unavailable



## APPENDIX A - TIME ZONES

The following is a list of the times zones as they are ordered in the Matrix Pro console.

Cities are first organized by area and then by state/city as seen here.

### Africa

Abidjan  
Accra  
Addis Ababa  
Algiers  
Asmara  
Bamako  
Bangui  
Banjul  
Bissau  
Blantyre  
Brazzaville  
Bujumbura  
Cairo  
Casablanca  
Ceuta  
Conakry  
Dakar  
Dar es Salaam  
Djibouti  
Douala  
El Aaiun  
Freetown  
Gaborone  
Harare  
Johannesburg  
Kampala  
Khartoum  
Kigali  
Kinshasa  
Lagos  
Libreville  
Lome  
Luanda  
Lubumbashi  
Lusaka  
Malabo  
Maputo  
Maseru  
Mbabane  
Mogadishu  
Monrovia  
Nairobi  
Ndjamena  
Niamey  
Nouakchott  
Ouagadougou  
Porto-Novo  
Sao Tome  
Tripoli  
Tunis  
Windhoek

### America

Adak  
Anchorage  
Anguilla  
Antigua  
Araguaina  
Argentina - Buenos Aires  
Argentina - Catamarca  
Argentina - Cordoba  
Argentina - Jujuy  
Argentina - La Rioja  
Argentina - Mendoza  
Argentina - Rio Gallegos  
Argentina - San Juan  
Argentina - Tucuman  
Argentina - Ushuaia  
Aruba  
Asuncion  
Atikokan  
Bahia  
Barbados  
Belem  
Belize  
Blanc-Sablon  
Boa Vista  
Bogota  
Boise  
Cambridge Bay  
Campo Grande  
Cancun  
Caracas  
Cayenne  
Cayman  
Chicago  
Chihuahua  
Costa Rica  
Cuiaba  
Curacao  
Danmarkshavn  
Dawson  
Dawson Creek  
Denver  
Detroit  
Dominica  
Edmonton  
Eirunepe  
El Salvador  
Fortaleza  
Glance Bay  
Godthab  
Goose Bay  
Grand Turk

Grenada  
Guadeloupe  
Guatemala  
Guayaquil  
Guyana  
Halifax  
Havana  
Hermosillo  
Indiana - Indianapolis  
Indiana - Knox  
Indiana - Marengo  
Indiana - Petersburg  
Indiana - Vevay  
Indiana - Vincennes  
Indiana - Winamac  
Inuvik  
Iqaluit  
Jamaica  
Juneau  
Kentucky - Louisville  
Kentucky - Monticello  
La Paz  
Lima  
Los Angeles  
Maceio  
Managua  
Manaus  
Martinique  
Mazatlan  
Menominee  
Merida  
Mexico City  
Miquelon  
Moncton  
Monterrey  
Montevideo  
Montreal  
Montserrat  
Nassau  
New York  
Nipigon  
Nome  
Noronha  
North Dakota - Centre  
North Dakota - New Salem  
Panama  
Pangnirtung  
Paramaribo  
Phoenix  
Port-au-Prince  
Port of Spain  
Porto Velho

Puerto Rico  
Rainy River  
Rankin Inlet  
Recife  
Regina  
Resolute  
Rio Branco  
Santiago  
Santo Domingo  
Sao Paulo  
Scoresbysund  
Shiprock  
St Johns  
St Kitts  
St Lucia  
St Thomas  
St Vincent  
Swift Current  
Tegucigalpa  
Thule  
Thunder Bay  
Tijuana  
Toronto  
Tortola  
Vancouver  
Whitehorse  
Winnipeg  
Yakutat  
Yellowknife

### Antarctica

Casey  
Davis  
DumontDURville  
Mawson  
McMurdo  
Palmer  
Rothera  
South Pole  
Syowa  
Vostok

### Arctic

Longyearbyen

### Asia

Aden  
Almaty  
Amman  
Anadyr  
Aqtau

Aqtobe  
 Ashgabat  
 Baghdad  
 Bahrain  
 Baku  
 Bangkok  
 Beirut  
 Bishkek  
 Brunei  
 Calcutta  
 Choibalsan  
 Chongqing  
 Colombo  
 Damascus  
 Dhaka  
 Dili  
 Dubai  
 Dushanbe  
 Gaza  
 Harbin  
 Hong Kong  
 Hovd  
 Irkutsk  
 Jakarta  
 Jayapura  
 Jerusalem  
 Kabul  
 Kamchatka  
 Karachi  
 Kashgar  
 Katmandu  
 Krasnoyarsk  
 Kuala Lumpur  
 Kuching  
 Kuwait  
 Macau  
 Magadan  
 Makassar  
 Manila  
 Muscat  
 Nicosia  
 Novosibirsk  
 Omsk  
 Oral  
 Phnom Penh  
 Pontianak  
 Pyongyang  
 Qatar  
 Qyzylorda  
 Rangoon  
 Riyadh  
 Saigon  
 Sakhalin  
 Samarkand  
 Seoul  
 Shanghai  
 Singapore

Taipei  
 Tashkent  
 Tbilisi  
 Tehran  
 Thimphu  
 Tokyo  
 Ulaanbaatar  
 Urumqi  
 Vientiane  
 Vladivostok  
 Yakutsk  
 Yekaterinburg  
 Yerevan

**Atlantic**

Azores  
 Bermuda  
 Canary  
 Cape Verde  
 Faroe  
 Jan Mayen  
 Madeira  
 Reykjavik  
 South Georgia  
 St Helena  
 Stanley

**Australia**

Adelaide  
 Brisbane  
 Broken Hill  
 Currie  
 Darwin  
 Eucla  
 Hobart  
 Lindeman  
 Lord Howe  
 Melbourne  
 Perth  
 Sydney

**Europe**

Amsterdam  
 Andorra  
 Athens  
 Belgrade  
 Berlin  
 Bratislava  
 Brussels  
 Bucharest  
 Budapest  
 Chisinou  
 Copenhagen  
 Dublin  
 Gibraltar  
 Guemsey

Helsinki  
 Isle of Man  
 Istanbul  
 Jersey  
 Kaliningrad  
 Kiev  
 Lisbon  
 Ljubljana  
 London  
 Luxembourg  
 Madrid  
 Malta  
 Mariehamn  
 Minsk  
 Monaco  
 Moscow  
 Oslo  
 Paris  
 Podgorica  
 Prague  
 Riga  
 Rome  
 Samara  
 San Marino  
 Sarajevo  
 Simferopol  
 Skopje  
 Sofia  
 Stockholm  
 Tallinn  
 Tirane  
 Uzhgorod  
 Vaduz  
 Vatican  
 Vienna  
 Vilnius  
 Volgograd  
 Warsaw  
 Zagreb  
 Zaporozhye  
 Zurich

**Indian**

Antananarivo  
 Chagos  
 Christmas  
 Cocos  
 Comoro  
 Kerguelen  
 Mahe  
 Maldives  
 Mauritius  
 Mayotte  
 Reunion

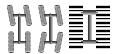



**Pacific**

Apia  
 Auckland  
 Chatham  
 Easter  
 Efate  
 Enderbury  
 Fakaofu  
 Fiji  
 Funafuti  
 Galapagos  
 Gambier  
 Guadalcanal  
 Guam  
 Honolulu  
 Johnston  
 Kiritimati  
 Kosrae  
 Kwajalein  
 Majuro  
 Marquesas  
 Midway  
 Nauru  
 Niue  
 Norfolk  
 Noumea  
 Pago Pago  
 Palau  
 Pitcairn  
 Ponape  
 Port Moresby  
 Rarotonga  
 Saipan  
 Tahiti  
 Tarawa  
 Tongatapu  
 Truk  
 Wake  
 Wallis







## APPENDIX B - FACTORY SETTINGS & RANGES

### Vehicle/Implement Configuration




#### Vehicle Setup

Icon	Description	Factory Setting	Range	User Setting
	Vehicle Type	Front Wheel		
	Antenna Height	12.0 ft 3.66 m	0.0 - 32.8 ft 0.0 - 10.0 m	
	Direction to Boom	Forward		
	Boom Offset Distance	0.0 ft 0.0 m	0.0 - 164.0 ft 0.0 - 50.0 m	



#### Implement Setup

Icon	Description	Factory Setting	Range	User Setting
	Number of Boom Sections	1	1-15	
	Guidance Width	60.0 ft 18.29 m	3.28 - 246.1 ft 1.0 - 75.0 m	
	Spray Width	12.0 ft 3.66 m	3.28 - 246.1 ft 1.0 - 75.0 m	
	Boom Section Width(s)	144.0 in 3.66 m	0.0 - 2952.7 in 0.0 - 75.0 m	
	Overlap	50%		
	Delay Off	1.0 s	0.0-10.0 s	
	Delay On	1.0 s	0.0-10.0 s	












#### Lightbar Setup

Icon	Description	Factory Setting	Range	User Setting
	LED Spacing	1.5 ft 0.46 m	0.04 - 9.8 ft 0.01 - 3.0 m	
	Display Mode	Swath		
	LED Brightness	50%	0 - 100%	


#### GPS Setup

Icon	Description	Factory Setting	Range	User Setting
	GPS Type	GPS/DGPS		
	GPS Port	Internal		

AutoSteer Setup

Icon	Description	Factory Setting	Range	User Setting
	Autosteer	On		
	Valve Type	Standard PWM		
	Valve Frequency	175 Hz	0.9 - 15000.1 Hz	
	Minimum Duty Cycle Left	20.0%	0.0 - 50.0%	
	Minimum Duty Cycle Right	20.0%	0.0 - 50.0%	
	Maximum Duty Cycle	50%	25 - 100%	
	Coarse Steering Adjustment	25.0	1.0-100.0	
	Fine Steering Adjustment	25.0	1.0-100.0	
	Deadband	1	1-10	
	Lookahead	4.0	0.0-10.0	
	Steering Wheel Sensor	Magnetic		
	Angle Sensor	Disabled		

Tilt Gyro Module Setup

Icon	Description	Factory Setting	Range	User Setting
	Tilt Correction On/Off	Off		

Video Setup

Icon	Description	Factory Setting	Range	User Setting
	Cameras	Normal		




 Data Management

Options




Icon	Description	Factory Setting	Range	User Setting
	Job Mode	<i>Varies depending on release version.</i>		

**Console Settings**


*Display Setup*

Icon	Description	Factory Setting	Range	User Setting
	Color Scheme	Style 1		
	LCD Brightness	41%	0 - 100%	
	Screenshot	Disabled		

*Cultural Setup*

Icon	Description	Factory Setting	Range	User Setting
	Units	US		
	Language	English-US		
	Time Zone	America - Denver		

*Sound Setup*

Icon	Description	Factory Setting	Range	User Setting
	Volume	60%	0 - 100%	

OVERVIEW

POWER

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HOME

FULL SCREEN

SETUP

GUIDANCE

APPENDIX

## APPENDIX C - UNIT SPECIFICATIONS

Dimensions	Matrix Pro 570G	6.36 x 5.87 x 2.3 in 16.15 x 14.91 x 5.84 cm
	Matrix Pro 840G	10.6 x 7.1 x 2.4 in 27.0 x 18.0 x 6.0 cm
Weight	Matrix Pro 570G	1.75 lb / 0.794 kg
	Matrix Pro 840G	2.35 lb / 1.06 kg
Connector	Power/CAN	8 pin Conxall
	Camera	5 pin Conxall
	Speed/Status	8 pin Conxall <i>WARNING! Some original Matrix Consoles have a 4 pin conxall cable connection. The 4-pin and 8-pin cables are NOT interchangeable.</i>
Environmental	Storage	-10 to +70°C
	Operating	0 to +50°C
	Humidity	90% non-condensing
Display	Matrix Pro 570G	320 x 240 resolution 5.7 in / 14.5 cm
	Matrix Pro 840G	800 x 600 resolution 8.4 in / 21.3 cm
Input/Output		USB 2.0
Power Requirement		< 9 watts @ 12 VDC

# MATRIX<sup>®</sup> PRO

## U S E R M A N U A L

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### Matrix Pro Guidance Features

- RealView™ Guidance Over Video
  - Guidance Superimposed Over Video
  - Guidance Only
  - Video Only
- Bright Daylight Readable Screen
- Easy-to-Use 3D Graphical Guidance
- Coverage Mapping/Data Export



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