BOOMPILOT®
JOB COMPUTER
U S E R   M A N U A L

Software version 0.00

TeeJet
TECHNOLOGIES

IS BUS TeeJet

A Subsidiary of Spraying Systems Co.

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To ensure optimal use of the equipment, please read this manual thoroughly. Please contact TeeJet Technologies Customer Support or an authorized TeeJet Technologies dealer if additional support is required.

RESPONSIBILITY FOR USE OF THIS PRODUCT

Regarding responsibility for use of this product, we refer to our sales and delivery terms which states:

Product Usage

Any use of the product is at the sole risk of the buyer. The buyer is therefore not entitled to any form for compensation caused by, for example, any of the following:

► Disturbance to/from any electronic services or products that do not conform to the standards for CE marketing;

► Missing or poor signal coverage or a succession hereof from external transmitters/receivers used by the buyer; Functional faults which apply to or from a PC-program or PC equipment not delivered by the seller;

► Faults that may arise from the buyers' negligence to react to warnings and fault messages from the product or that can be traced to negligence and/or absent constant control of the work carried out in comparison to the planned job.

When implementing any new equipment the buyer must take great care and pay attention. Any doubts as to the correct operation/use should result in contacting the seller's service department.

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CHAPTER 1– PRODUCT OVERVIEW

BoomPilot (automatic boom section control) is possible in combination with software built into the IC18 Sprayer/NH3 Electronic Control Unit (ECU). The ECU should be combined with the appropriate cable to interface with your BoomPilot system, spray controller and/or spraying machine for quick and easy installation. Electronic Control Units and their related cables are designed to control as many boom sections as the spray controller to which they are connect, up to a maximum of 9 boom sections.

Figure 1-1: BoomPilot Electronic Control Unit

OPTIONAL SYSTEM COMPONENTS

Matrix 570VT

The Matrix 570VT is a simple to operate, ISOBUS-certified 5.7" color touch screen display suitable for bright daylight and nighttime operation

Figure 1-2: Matrix 570VT

Switchbox

Manual section control with remote master capibility. The switchboxes are available in:

► 9 section output or 8 sections and a master output.

► 6 section output or 5 sections and a master output.

Figure 1-3: Switchboxes

IC18 Sprayer/NH3 ECU

Use with your existing VT or Matrix® 570VT

• Works seamlessly and displays on any ISOBUS VT

• Easy navigation menu and data rich display

• IC18 Sprayer ECU suitable for use with NH3 and liquid fertilizer

• Automatic boom section control upgrade option

• Variable rate control available providing your VT has GPS and task control capability

• Add additional ISOBUS ECUs as your needs change

• Provides basic rate control

• Standardized plugs, cables and software simplify installation and connectivity and result in true "plug and play" technology. IC18 ECU resides on the implement, reducing hardware in the cab
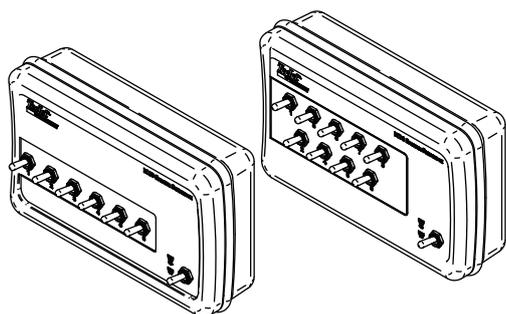
Figure 1-4: IC18 Job Computer

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CHAPTER 2 – GETTING STARTED

- A firm touch is required when selecting a screen icon.
- Settings are NOT automatically saved when selected. The ACCEPT KEY ✓ must be selected to save the setting. Select the ESCAPE KEY ↰ to escape without saving settings and return to the previous menu.
- The menu structure on your display might vary from the one displayed in this User Manual depending on the virtual terminal being used.

START UP

Power is continuously supplied to the job computer. The virtual terminal will give access to the job computer options and operation.

Figure 2-1: Master Screen

- Matrix VT Setup Key
- BoomPilot
- Other options as available on ISOBUS system
- Master Screen Key
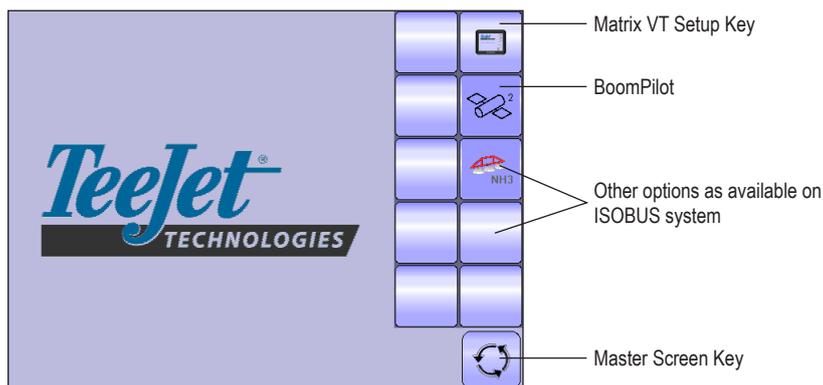
PAGE LAYOUT AND NAVIGATION

The Master Screen gives access to the systems currently available on your VT. From the Master Screen, the Home Screen gives access to the BoomPilot ECU's available functions.

Home Screen

The Home Screen gives access to the BoomPIlot ECU's available functions: Operation Mode and Main Setup.

Figure 2-2: Home Screen - BoomPilot Mode

- Operation Mode
- Main Setup Mode

Overlapping mode	100%
Antenna -> hitch [m]	0.00
GPS alarm at loss of	GPS
GPS input source	RS232

- Master Screen Key
- Quick View Information Based on Current Active Trip
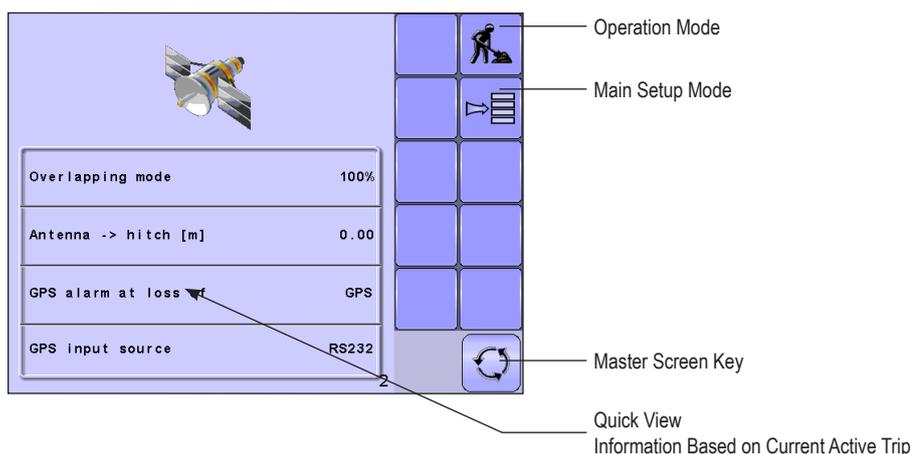
Operation Mode

Information on the Operation screen will vary depending on the parameters set by the user and the OEM.

Figure 2-3: Operation Mode

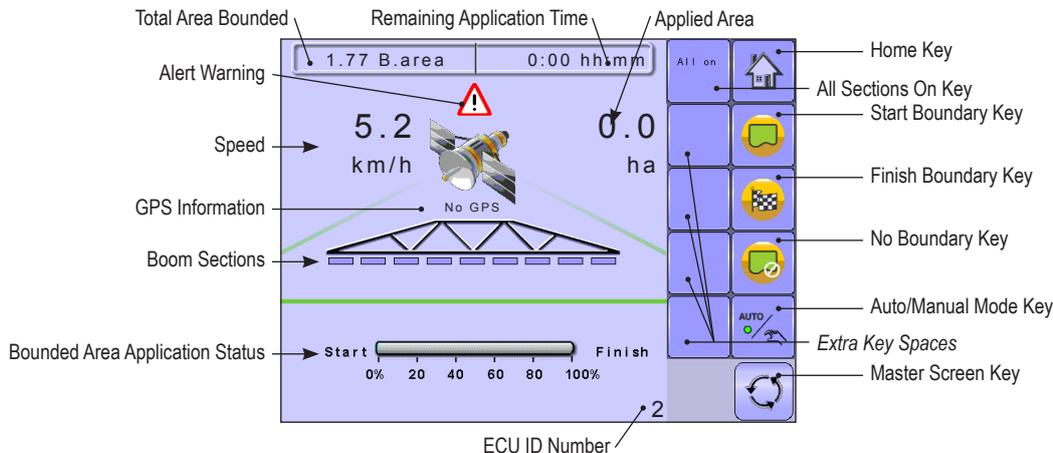| Label (left)		Label (right)
Total Area Bounded	Remaining Application Time	Applied Area
Alert Warning		Home Key
		All Sections On Key
Speed		Start Boundary Key
GPS Information		Finish Boundary Key
Boom Sections		No Boundary Key
		Auto/Manual Mode Key
		Extra Key Spaces
Bounded Area Application Status		Master Screen Key
	ECU ID Number	

Operation screen values shown:

- 1.77 B.area   0:00 hh:mm   All on
- 5.2 km/h   No GPS   0.0 ha
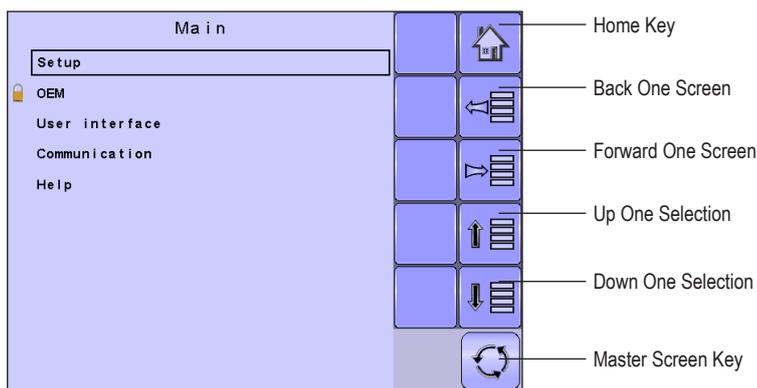- Start 0% 20 40 60 80 100% Finish
- 2

Main Setup Mode

The main setup menu contains five options. Each of these options either directly access settings or additional menus.

Figure 2-4: Main Setup Screen

Main
- Setup
- OEM
- User interface
- Communication
- Help

Keys:
- Home Key
- Back One Screen
- Forward One Screen
- Up One Selection
- Down One Selection
- Master Screen Key

The table below outlines the additional menus.

MAIN SETUP MODE MENU STRUCTURE

Setup	OEM	User Interface	Communication	Help
GPS Setup				Diagnostic
Machine Setup				About

The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment.

NOTE: Select functions may not be visible due to OEM settings, available equipment or sensors.

ISOBUS Job Computer : BoomPilot®

Main Setup Menu Icons and Section Overviews

Figure 2-5: Enter Selection Screens

Selection

Slide Bar with Decrease One Selection and Increase One Selection Arrows

Accept Key

Escape Key

Number Pad

Close Number Pad Key

Range Maximum

Range Minimum

Zoom In Key

Zoom Out Key

Open Number Pad Key

Available Selections

Up One Selection

Accept Key

Escape Key
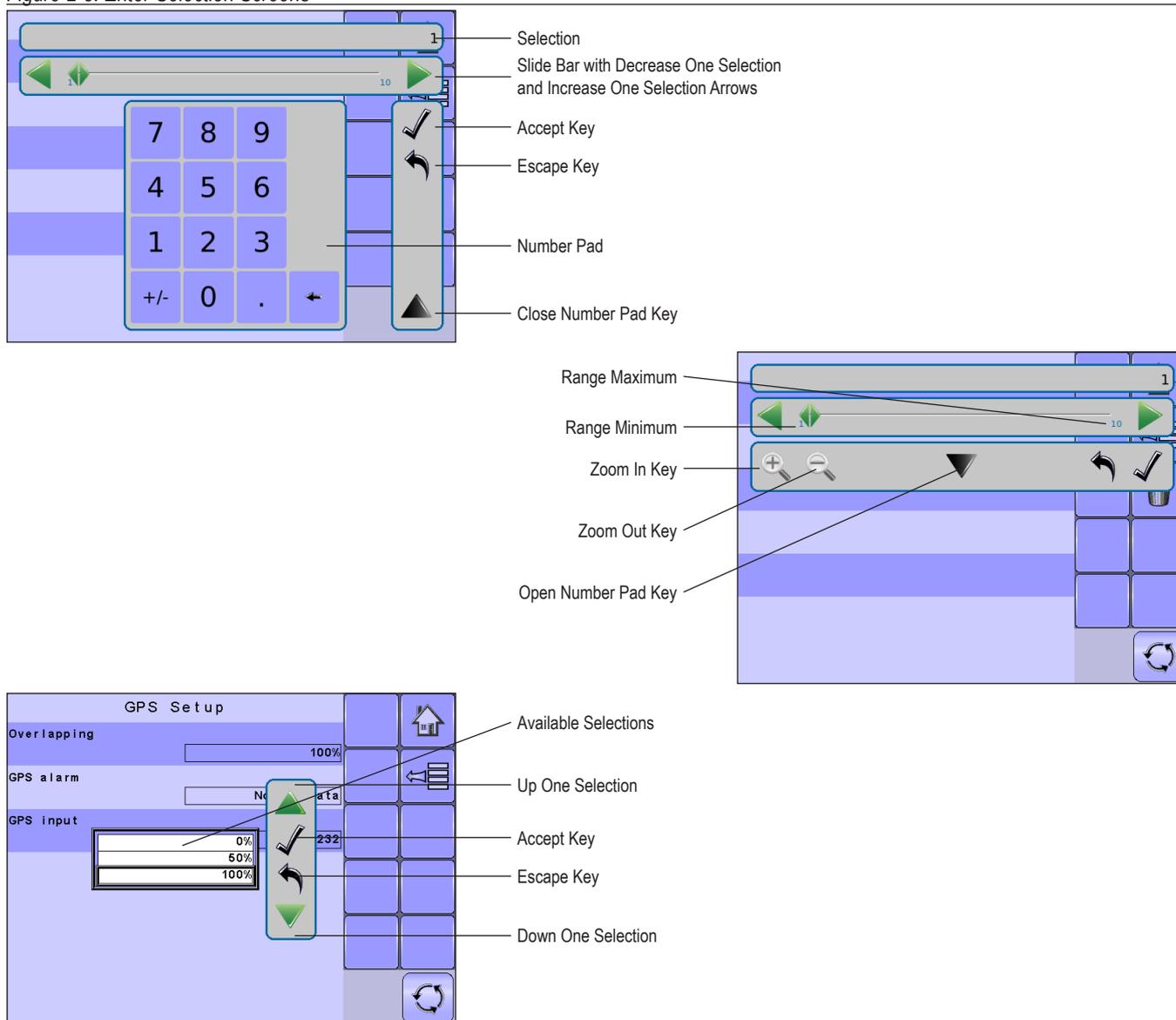
Down One Selection

Section or Icon	Description
Accept Key ✓	Accepts the new selection
Close Number Pad Key ▲	Minimizes the number pad
Decrease One Selection Arrow ◄	Decreases the setting
Down One Selection Arrow ▼	Highlights the selection below
Escape Key ↰	Escapes without saving changes
Increase One Selection Arrow ►	Increases the setting
Number Pad	Use the numbers to set the selection value
Open Number Pad Key ▼	Maximizes the number pad

| Section or Icon	Description
Selection	Displays the current or new selection
Slider	Slide to the left to decrease or right to increase the selection
Slide Bar	Selects the setting by pressing and releasing on the slide bar or pressing and dragging the Slider to a designated value. Range for a specific setting is displayed on the slide bar.
Up One Selection Arrow ▲	Highlights the selection above
Zoom In Key	Narrows slide bar range. Gray = maximum zoom level.
Zoom Out Key	Expands slide bar range. Gray = minimum zoom level.

CHAPTER 3 – MAIN SETUP
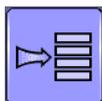
Main Setup Mode configures the Setup, OEM, User Interface, Communication and Help options.

NOTE: The menu structure on your display might vary from the one displayed in this User Manual depending on the virtual terminal being used.

Figure 3-1: Main Setup Screen
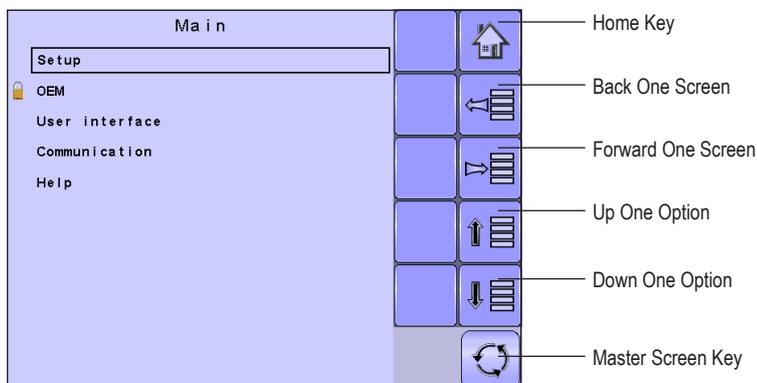
Home Key
Back One Screen
Forward One Screen
Up One Option
Down One Option
Master Screen Key

MAIN SETUP MODE MENU STRUCTURE

Setup	OEM	User Interface	Communication	Help
GPS Setup				Diagnostic
Machine Setup				About

The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment.

Main Setup Screen

NOTE: Settings are NOT automatically saved when selected. The ACCEPT KEY ✔ must be selected to save the setting. Select the ESCAPE KEY ↩ to escape without saving settings and return to the previous menu.

To access the Main Setup screens:

1. Select BOOMPILOT ECU KEY ⌗ from the Master Screen.
2. Select MAIN SETUP SCREEN KEY ⌗ from the Home Screen.
3. Select from:
   ► Setup – used to configure the GPS settings and Machine settings
      ◄ GPS Setup – used to establish the Overlapping percentage, GPS Alarm and GPS Input
      ◄ Machine Setup – used to establish the delay off and delay on time; front or back implement mounting position; and distance from the boom and the antenna to the mounting point
   ► OEM – used to establish if the antenna is machine mounted and its associated distance from the hitch
   ► User Interface – used to allow the operator to select the system virtual terminal (VT) and ECU identification number
   ► Communication – used to establish the BoomPilot ECU's ability to communicate with an external computer
   ► Help – allows the operator to choose between Diagnostics and the About screen
      ◄ Diagnostic – used to provide information regarding the BoomPilot protocol, VT and TECU.
      ◄ About – used to provide information on the console such as software version, build number, etc

NOTE: The menu structure on your display might vary from the one displayed in this User Guide depending on the virtual terminal being used. This User Guide will display all possible options.

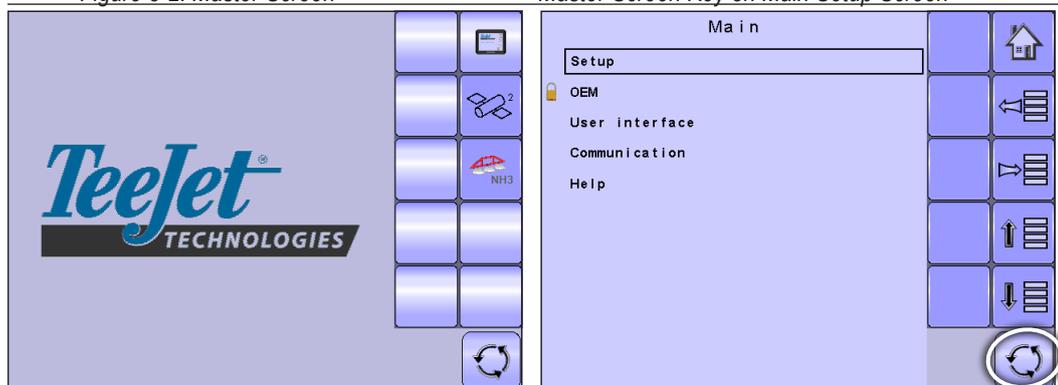# ISOBUS Job Computer : BoomPilot®

Master Screen

The Master Screen gives access to the systems currently available on your VT.

• To view the Master Screen options, select MASTER SCREEN KEY 🔄 in bottom right corner of any screen.

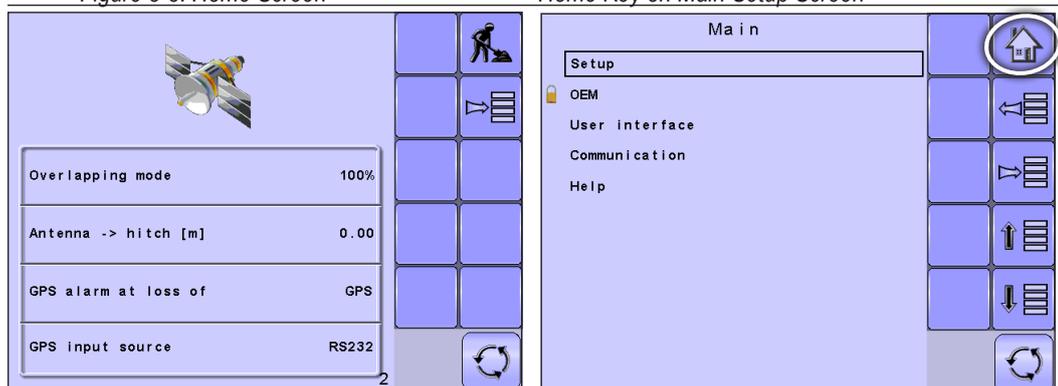*Figure 3-2: Master Screen*　　　　　*Master Screen Key on Main Setup Screen*

Home Screen

The Home Screen gives access to the BoomPilot ECU's available functions: Operation Mode and Main Setup.

• To view the Home Screen, select HOME KEY 🏠 in the top right corner of any screen.

*Figure 3-3: Home Screen*　　　　　*Home Key on Main Setup Screen*

SETUP

Setup configures the GPS settings and Machine settings.

1. From the Main Setup Screen, select SETUP.

2. Select from:
   ► GPS Setup – used to establish the Overlapping percentage, GPS Alarm and GPS Input
   ► Machine Setup – used to establish the delay off and delay on time; front or back implement mounting position; and distance from the boom and the antenna to the mounting point

Figure 3-4: Setup
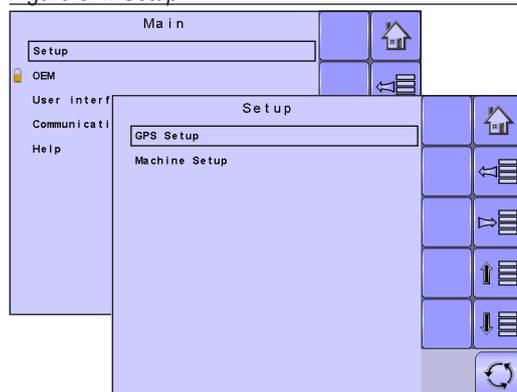
GPS Setup

GPS setup establishes the Overlapping percentage, GPS Alarm and GPS Input.

Overlapping

Overlapping determines the amount of overlap allowed when each boom section is turned on and off using Automatic Boom Section Control. Select from 0%, 50% or 100%.

- To select the Overlapping percentage, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

GPS Alarm

GPS Alarm determine if an alarm sounds when GPS or DGPS is lost or if there are no GPS alarms.

- To select the GPS alarm type, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

GPS Input

GPS Input determines if the GPS signal is through the internal GPS or an external RS232 port.

- To select the GPS input type, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

Machine Setup

Machine Setup establishes the delay off and delay on time; front or back implement mounting position; and distance from the boom and the antenna to the mounting point.

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.

- To select the delay off time, use the number pad or slide bar.

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.

- To select the delay on time, use the number pad or slide bar.

Front or Back Mounted Implement

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.

- To select the mounting placement, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

Distance from Boom to Mount Point

Distance to Boom defines the distance from the hitch or mount point to the boom. Range is 0.00 - 50.00 meters.

- To select the distance, use the number pad or slide bar.

Distance from Antenna to Mount Point

Distance from Antenna defines the distance from the hitch or mount point to the antenna. The antenna should be behind the mount point (machine mounting is set in OEM options). Range is 0.00 - 200.00 meters.

- To select the distance, use the number pad or slide bar.
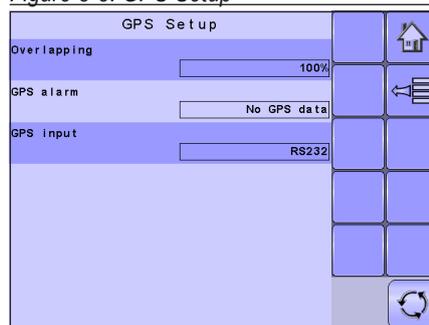

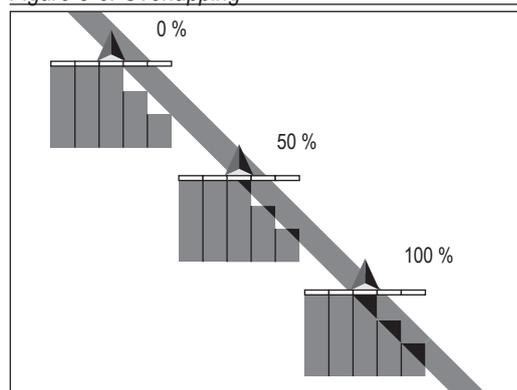*Figure 3-5: GPS Setup*

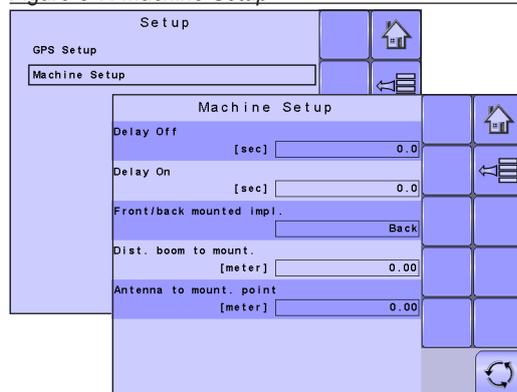*Figure 3-6: Overlapping*
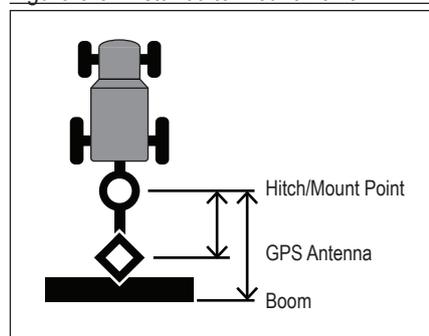

Figure 3-7: Machine Setup

Figure 3-8: Distance to Mount Point

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OEM

The OEM setup menu is password protected and the settings in this menu are directly related to the fitted OEM equipment. To obtain an access code, contact your local dealer or TeeJet Technologies Customer Service.

To access the OEM screens:

1. From the Main Setup Screen ⊞, select OEM.
2. Select OEM.
3. Select the Access Code Entry Box to the right of the menu option.
4. Use the number pad or slide bar to enter the access code.
5. Select the ACCEPT KEY ✓ to complete the unlock process

Antenna Machine Mounted

Antenna Machine Mounted sets if the antenna is mounted on the machine, not the implement/boom. Range is 0.00 - 200.00 meters.

- To set if the antenna is machine mounted, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

Distance from Hitch to Antenna

Distance from Antenna defines the distance from the hitch or mount point to the antenna. This option is only available if the antenna is machine mounted and the "Antenna Machine Mounted" options is "Yes". Range is 0.00 - 200.00 meters.

- To set the distance, use the number pad or slide bar.
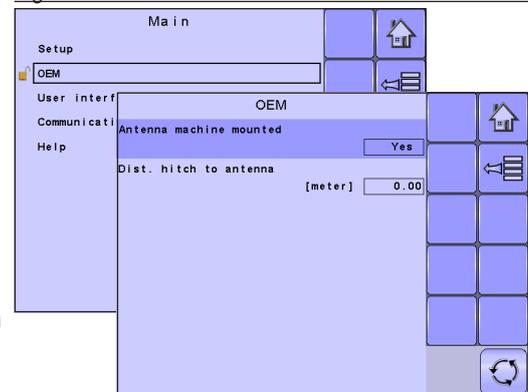
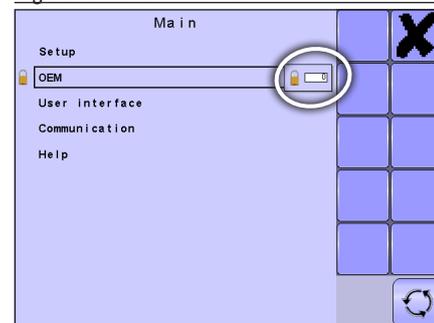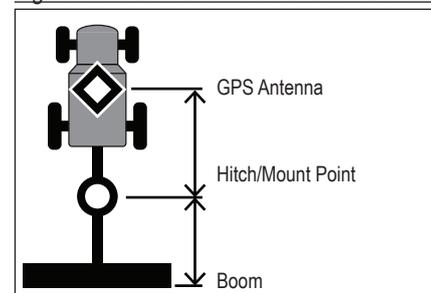*Figure 3-9: OEM*

Figure 3-10: OEM Unlock

Figure 3-11: Distance from Hitch to Antenna

USER INTERFACE

User Interface allows the operator to select the system virtual terminal (VT) and ECU identification number.

1. From the Main Setup Screen ⊞, select USER INTERFACE.

Use Preferred VT

Use Preferred VT sets the virtual terminal preference to either on or off. If "On" is selected, the preferred VT will be used. If "Off" is selected, the system will arbitrarily select which VT to use (if more than one VT is available on the ISOBUS CAN).

- To set the Use Preferred VT mode, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

NOTE: This should always be set to "off" unless another VT is on the CAN bus.

Show Number on Soft Key

Show Number on Soft Key establishes if a user assigned identification number will be visible on the Master Screen, Home Screen and Operation Screen.

- To set the Soft Key Number mode, select an option from the drop down menu or use the UP/DOWN ARROWS to highlight the option.

NOTE: Typically used only if more than one (1) BoomPilot ECU is on the CAN bus.

BoomPilot ECU Number (FI)

BP ECU Number is the identification number referring specifically to the BoomPilot ECU.

- To set the BoomPilot ECU Number, use the number pad or slide bar.
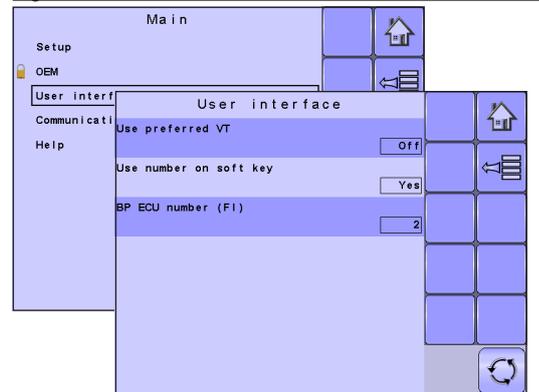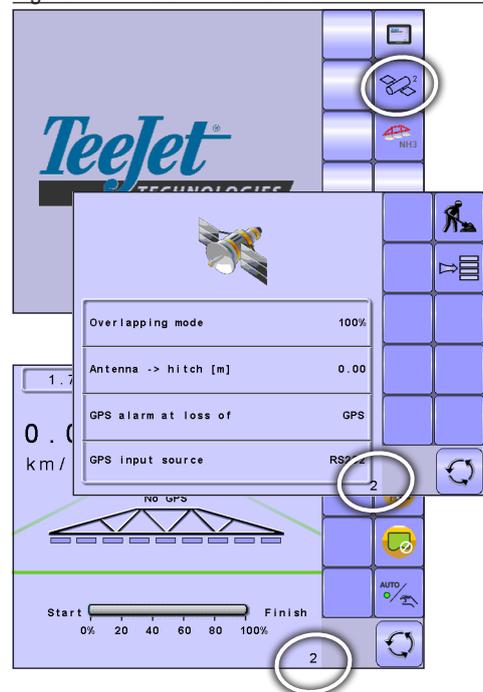
Figure 3-12: User Interface
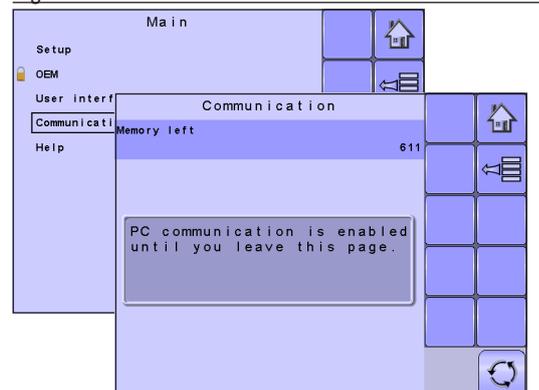

Figure 3-13: BoomPilot ECU Number

COMMUNICATION

Communication establishes the BoomPilot ECU's ability to communicate with an external computer.

1. From the Main Setup Screen ⊞, select COMMUNICATION.

Figure 3-14: Communication

HELP

The Help menu allows the operator to choose between Diagnostics and the display of information about serial number, CAN BUS information, etc. These menus are typically accessed upon Customer Service personnel request only.

1. From the Main Setup Screen ⊞, select HELP.
2. Select from:
   ► Diagnostic – used to provide information regarding the BoomPilot protocol, VT and TECU.
   ► About – provides information on the console such as software version, build number, etc.

Diagnostic

Diagnostic is used to provide information regarding the BoomPilot protocol, VT and TECU.

► BoomPilot Protocol – provides information regarding the IC18 pairing and the pair's associated boom sections.

► VT – provides information regarding the virtual terminal controller.

► TECU – provides information regarding the TECU.

BoomPilot Protocol

BoomPilot Protocol provides information regarding to which IC18 ECU (per IC18 identification number) the BoomPilot ECU is paired, and the pair's associated boom sections.
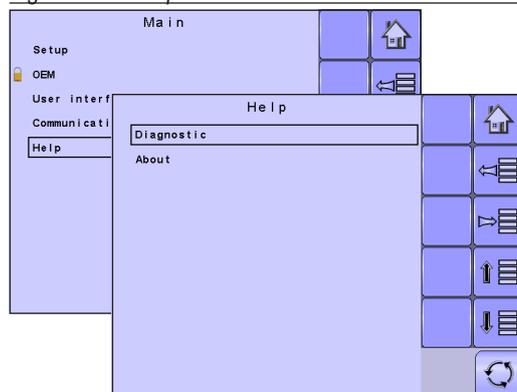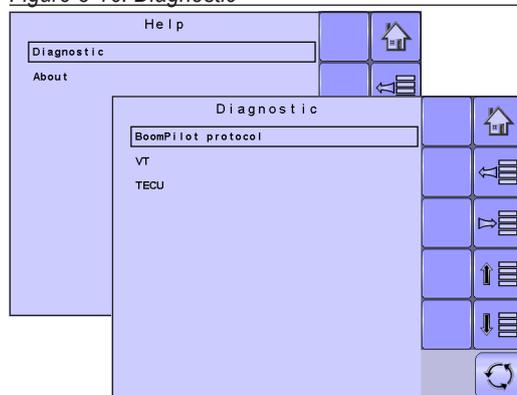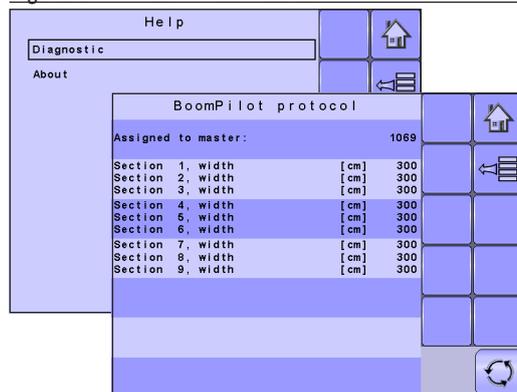
Figure 3-15: Help

Figure 3-16: Diagnostic

Figure 3-17: BoomPilot Protocol

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VT Data

The Virtual Terminal (VT) menu provides information regarding the virtual terminal controller (i.e., address version, etc.).

- If more terminals/controllers are used, switch between these by pressing the GO TO NEXT VT KEY .
- Press the DELETE OBJECT POOL KEY to upload information from the IC18 Job Computer to the Virtual Terminal.

NOTE: Restart the IC18 Job Computer to implement and display changes.

TECU

The TECU is a control unit, residing on the tractor, that performs basic functions such as power handling, speed info, etc. The TECU data are displayed on this page.
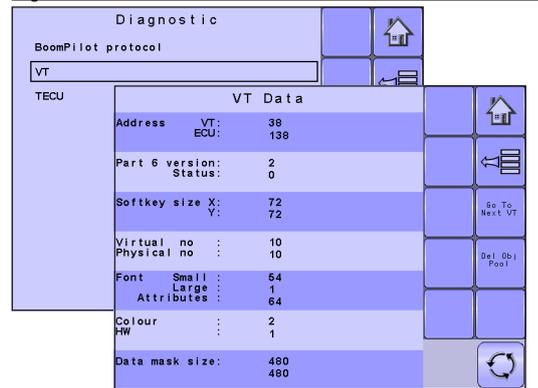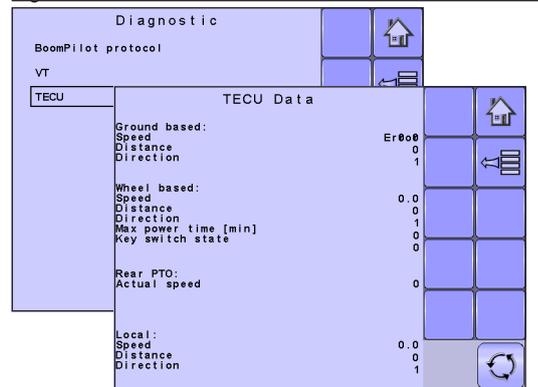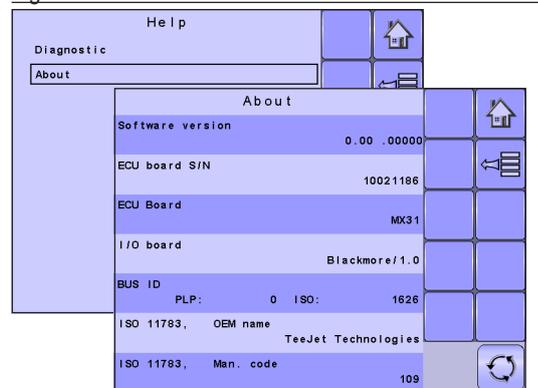
About

The About screen provides information on the ECU such as software version, build number, etc. This information may become useful in case of technical support.

Figure 3-18: VT Data

Figure 3-19: TECU

Figure 3-20: About

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CHAPTER 4 – OPERATION MODE

The Operation Screen accesses the working aspects of the BoomPilot ECU including boom section control and trip/application information.
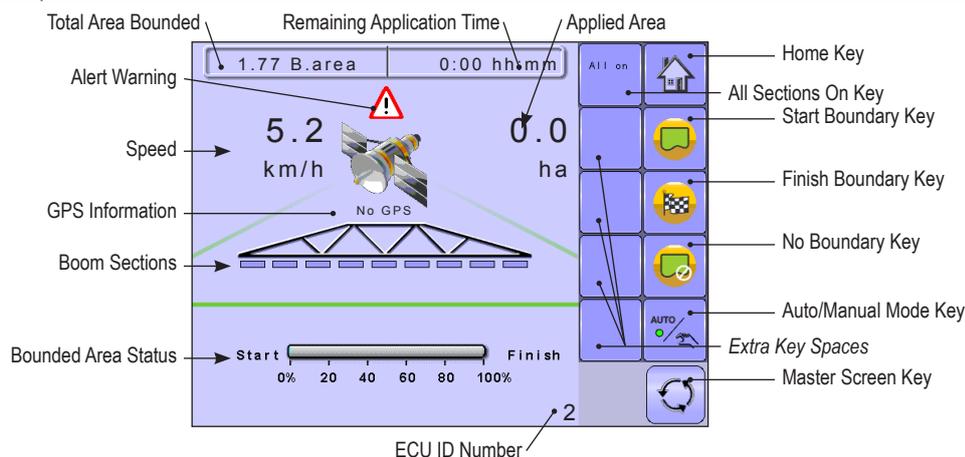
NOTE: *Settings are automatically saved when selected.*

NOTE: *The menu structure on your display might vary from the one displayed in this User Manual depending on the virtual terminal being used.*

OPERATION MODE OVERVIEW

Information on the Operation screen will vary depending on the parameters set by the user and the OEM.

Figure 4-1: Operation Mode Screen Overview

Keys Descriptions

Icon		Description
	Home Key	Press to return to the Home Screen
	Start Boundary Key	Press to start a new boundary
	Finish Boundary Key	Press to finish the boundary. A straight line will complete the boundary between your current location and the starting point
	No Boundary Key	Press to apply without using a boundary
	Auto/Manual Key	Press to toggle between automatic and manual application modes • Automatic mode will turn on ABSC (automatic boom section control) • Manual mode will turn off ABSC.
	All Sections On Key	Press to turn on all sections whether or not you are in an applied or not applied area

Section and Icon Descriptions

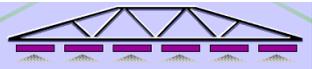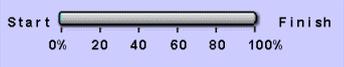| Section or Icon		Description	
Job Information		This information bar displays the total area bounded and remaining application time	1.77 B.area 0:00 hh:mm
	Total Area Bounded	Displays the total area bounded in current boundary	
	Remaining Application Time	Displays the amount of time remaining to completely cover the area bounded based on the current speed and rate of application	
Speed		Displays vehicle speed	

| Section or Icon	Description
Applied Area	Displays the actual application per hectare/acre
Alarm ⚠	Displayed if an alarm condition is active
GPS Information	Displays the current GPS status or mode
Boom Sections	Displays the active ▱ and inactive ▱ boom sections as well as if they are on ▱ (spray is blue) or off ▱ (spray is gray).
Sprayer ID Number	Displays the soft key number assigned to the displayed IC18 ECU.
Bounded Area Status	This information section displays the current or applicaion boundary status
Bounded Area Coverage Status	Displays the amount of the bounded area that has had application applied to it
Boundary In Progress	Displays when a boundary is being created
No Boundary	Displays when no boundary is available

Master Screen

The Master Screen gives access to the systems currently available on your VT.

• To view the Master Screen options, select MASTER SCREEN KEY in bottom right corner of any screen.

Figure 4-2: Master Screen   *Master Screen Key on Operation Mode Screen*
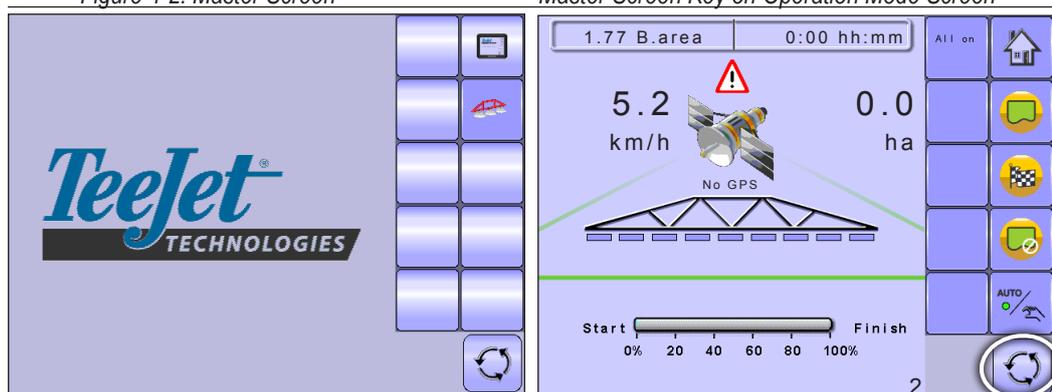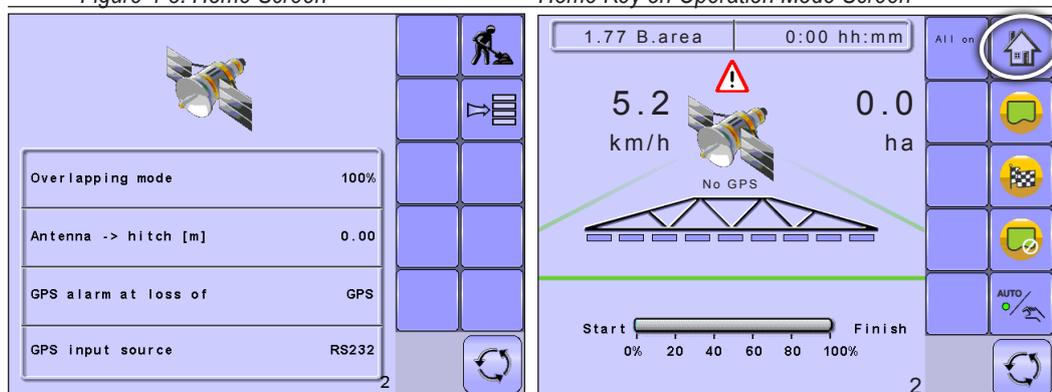

Home Screen

The Home Screen gives access to the BoomPilot ECU's available functions: Operation Mode and Main Setup.

• To view the Home Screen, select HOME KEY in the top right corner of any screen.

Figure 4-3: Home Screen   *Home Key on Operation Mode Screen*

APPLICATION BOUNDARY

Application boundaries establish areas where application is and is not applied while using ABSC or BoomPilot.

To establish an application boundary:

1. Drive to a desired location at the perimeter of the field/application area.

2. Press START BOUNDARY KEY 🟩.

3. Travel the perimeter of the field/area.

4. Finish boundary:

   ► Travel to within one swath width of the starting point. The boundary will close automatically (the operations screen will begin showing the Bounded Area Coverage Status in the Bounded Area Status section).

   ► Press BOUNDARY FINISH KEY 🏁. A straight line will complete the boundary between your current location and the starting point

NOTE: The boundary will not be available if the minimum distance is not travelled (five-times the swath width).

To apply without a boundary:

1. Drive to a desired location at the perimeter of the field/application area.

2. Press NO BOUNDARY KEY 🟩.

3. Begin application.

Bounded Area Coverage Status

Bounded Area Coverage Status displays the amount of the bounded area that has had application applied to it.
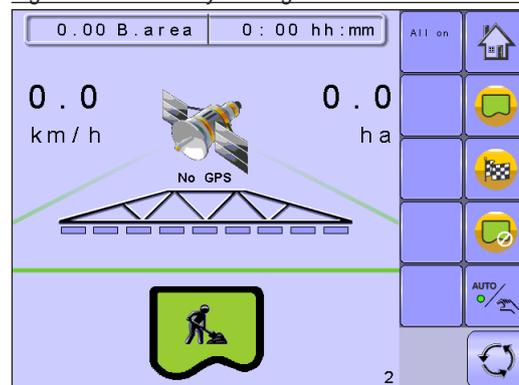
Figure 4-4: Boundary in Progress

Figure 4-5: Bounded Area Coverage Status

AUTOMATIC OR MANUAL SECTION CONTROL

Automatic mode will turn on ABSC (automatic boom section control).

• Automatically control when boom sections are turned on/off as an applied area is entered/exited.

Manual mode will turn off ABSC. Section control will be controlled by the associated IC18.

1. On the Operation Screen 🚶, establish Automatic Operation Mode or Manual Operation Mode by pressing the AUTO/MANUAL KEY 🔲 so that the green dot is on AUTO (automatic) or the hand (manual) accordingly.

Figure 4-6: Auto/Manual Key

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ALL SECTIONS ON

All Sections On will turn all sections on whether you are in an applied area or not.

1. On the Operation Screen 👷, turn all sections on by pressing the ALL ON KEY.

NOTE: *Pressing and holding the ALL ON KEY will force all sections to remain on. When you release the ALL ON KEY, the sections will go back to the previous mode (auto/manual).*
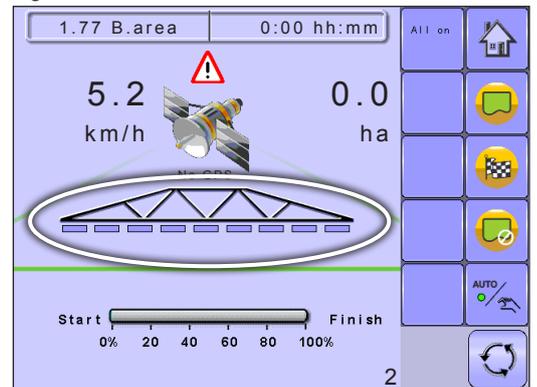
Figure 4-7: All On Key
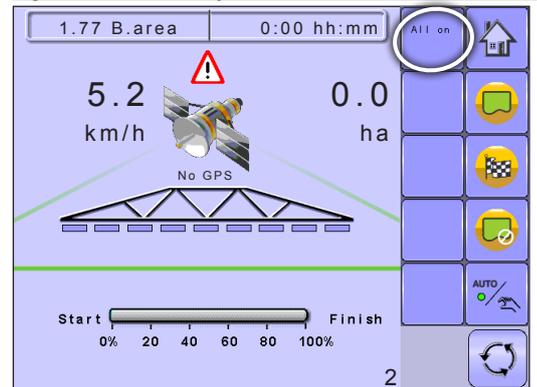
BOOM SECTIONS

Boom Sections displays the active 🔺 and inactive ▬ boom sections as well as if they are on 🔺 (spray is blue) or off 🔺 (spray is gray).

Figure 4-8: Boom Sections

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APPENDIX A - FACTORY SETTINGS & RANGES

SETUP

GPS Setup

Description	Factory Setting	Range/Options	User Setting
Overlapping	100%	0%, 50%, 100%	
GPS Alarm	No GPS Data	No GPS Data No DGPS Data No GPS Alarms	
GPS Input	Internal	Internal RS232	

Machine Setup

Description	Factory Setting	Range/Options	User Setting
Delay Off	0.0	0.0 - 10.0 sec	
Delay On	0.0	0.0 - 10.0 sec	
Front or Back Mounted Implement	Back	Front Back	
Distance from Boom to Mount Point	0.00	0.00 - 50.00 m	
Distance from Antenna to Mount Point	0.00	0.00 - 200.00 m	

OEM

Description	Factory Setting	Range/Options	User Setting
Antenna Machine Mounted	No	Yes No	
Distance from Hitch to Antenna	0.00	0.00 - 500.00 m	

USER INTERFACE

Description	Factory Setting	Range/Options	User Setting
Use Perferred VT	Off	Off On	
Show Number on Soft Key	No	No Yes	
BoomPilot ECU Number (FI)	1	1 - 9	

APPENDIX B - UNIT SPECIFICATIONS

Dimensions	19.05 x 18.42 x 6.03 cm
Weight	0.644kg
Connector	30 position Cinch pins. A1-K3
	30 position Cinch pins. L1-Y3
Environmental Operating	-40 to +85°C
Humidity	90% non-condensing
Input/Output	ISO 11783 (ISOBUS)
Power Requirement	<9 watts @12 VDC

BOOMPILOT®
JOB COMPUTER
U S E R   M A N U A L

Software Version 0.00

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