

844-AB SPRAYER CONTROL

USER GUIDE MANUAL

For use with software version 4.02.



TeeJet[®]
TECHNOLOGIES

A Subsidiary of  Spraying Systems Co.[®]

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Table of Contents

CHAPTER 1 - INTRODUCTION	3
Power on the console.....	3
Power off the console	3
CHAPTER 2 - APPLICATION MODE	4
Airblast mode.....	4
Vineyard mode	4
CHAPTER 3 - OEM SETUP	4
Application type	4
Number of sections.....	4
Minimum voltage	5
Deadband.....	5
Rotation speed	5
Display stable.....	5
Total area	5
Maximum speed	5
Memory option	6
Tank content.....	6
CHAPTER 4 - SYSTEM SETUP	6
Units of measurement	6
Reset to default.....	7
Sensor selection.....	7
Flow meter impulses	7
Manual entry	7
Automatic calibration	7
Pressure transducer low pressure calibration (P Ref)	8
Manual entry	8
Automatic calibration	8
Pressure transducer maximum rating (P HI)	8
Speed sensor calibration.....	9
Proximity/magnetic impulses	9
Automatic calibration.....	9
Manual calculation	9
Radar speed impulses	9
Automatic calibration.....	10
Manual calculation	10
Simulated ground speed	10
Reference flow rate per section.....	11
1. Select section	11
2. Reference pressure	11
3. Reference flow	11
Next section	11
Regulating valve response time	12
Pressure regulating mode	12
Minimum pressure setting	12
Density (Liquid specific gravity)	13
Communications	13

Faces per section setting (HC mode only)	13
--	----

CHAPTER 5 - SWATH WIDTH PRESETS **14**

Selecting swath preset	14
------------------------------	----

CHAPTER 6 - APPLICATION SETUP **15**

Preset flow rate selection.....	15
Nozzles per face	15
Target application rate.....	15
Calculation diagnostic	15
Adjust pressure	16
Adjust speed	16
Liquid density	16

CHAPTER 7 - OPERATIONS **17**

Spraying	17
----------------	----

CHAPTER 8 - FEATURES **18**

Boost mode.....	18
Area/volume display.....	18
Application alarm	18
No flow alarm.....	19
Automatic power down	19
Printing.....	19

CHAPTER 1 - INTRODUCTION

This user guide provides information for software version 4.02.

Make sure that all hardware components are properly installed and tested. Before starting the programming process, confirm that the console and all sensors are working properly.

IMPORTANT! Before beginning, review the following programme guidelines that control the programming process.

To exit any Setup mode, press and hold the Programme **[P]** key for 3 seconds. The inputs are stored and the computer will exit Programme mode.

To increase the value of a programmable digit, press the Plus **[+]** key. To decrease the value, press the Minus **[-]** key. These keys are located directly to the right of the display. For some programme steps, press and hold the Plus **[+]** and Minus **[-]** keys to quickly change the values. Press the Plus **[+]** and Minus **[-]** keys once to increment/decrement the values by one unit.

Press and hold the Plus **[+]** and Minus **[-]** keys simultaneously to reset the value to "0" or begin automatic calibration.

Press the Programme **[P]** key to advance the system to the next programme step. After the final programme step is complete, the console will finish the programming loop and return to the initial programming step.

System setup mode contains the options that customize the controller to the sprayer or sprayer components. These include calibration steps and parameters that seldom change once programmed.

Application setup mode contains settings that are frequently changed (nozzle spacing, number of nozzles per boom section, density, nozzles used and target application rate).

Figure 1: 844-AB console



Power on the console

The 844-AB console can be powered on by pressing the Programme **[P]** key one time. The console will initially display the software version at the top of the screen and the serial number of the console at the bottom of the screen. After approximately 5 seconds, the console will enter into swath width view.

Press the Programme **[P]** key to advance to normal Operations mode.

Figure 2: Power on the console

AbL		4.03									
922		5555									
1	2	3	4	5	6	7	8	9	10	11	12

Power off the console

To power off the 844-AB console, press and release the Minus **[-]** and Programme **[P]** keys simultaneously. The console will save new information (area and volume counters) to memory before it powers down. "Off" will be displayed on the console, followed by a 5-second countdown, indicating the console is about to power down. The console also has an automatic power down feature. This is described in further detail in the Features section of this User guide.

Figure 3: Power off the console

OFF											
5											
1	2	3	4	5	6	7	8	9	10	11	12

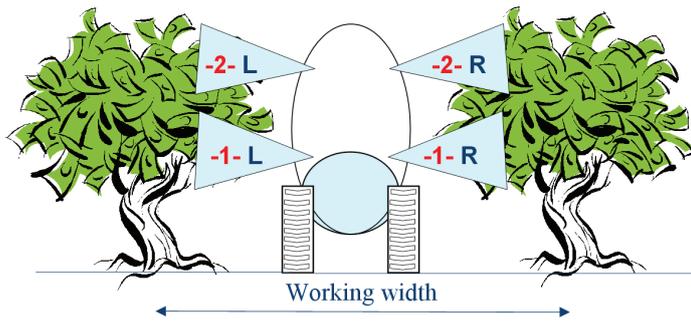
CHAPTER 2 - APPLICATION MODE

The 844-AB gives the possibility of working in two different ways to fit the application. Therefore, the console should be set up and consequent programming and working features will be dependant of the chosen mode.

Airblast mode

This mode is designed to work with Airblast sprayers, mostly spraying on two sides (left and right) with the possibility to switch on or off sections in the height. The working width is defined by the distance between two rows of trees. This mode is called AB (airblast).

Figure 4: Airblast (AB) principle

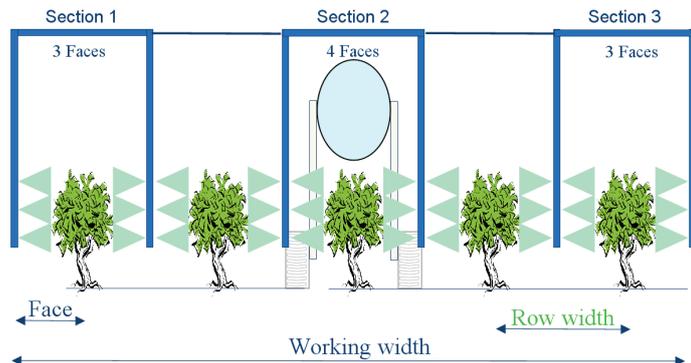


Vineyard mode

This mode is designed to work with vineyard sprayers that are spraying horizontally. Several rows are covered and sections can be switched on or off to adapt the working width. Each section covers a number of faces. The working width is defined by the number of faces and the row width.

One or more nozzles can be spraying each face. If all nozzles spraying on a face are not equal, they should be considered as a unique nozzle and the total flow has to be set up in the configuration menu. But all faces have to be sprayed equally. This mode is called HC (vineyard).

Figure 5: Vineyard (HC) principle



CHAPTER 3 - OEM SETUP

OEM setup mode contains the options that customize the controller to the sprayer or sprayer components. These include calibration steps and parameters that will never change once programmed.

ADVISORY! OEM setup parameters (except HC/AB mode) should not be changed unless advised by TeeJet Technologies or an authorized dealer.

To enter System setup mode, power off the console. Press and hold the Plus (+) and Minus (-) keys simultaneously. While holding the Plus (+) and Minus (-) keys, also press the Programme (P) key four times (within 3 seconds) and then release all keys to enter OEM setup mode.

Press and hold the Programme (P) key for three seconds to exit OEM setup mode. Changes will be saved to the console's memory.

Application type

As explained above, the 844-AB is capable of working in either Airblast (AB) or Vineyard (HC) mode.

Use the Plus (+) and Minus (-) keys to switch from AB to HC mode. Press the Programme (P) key to accept the value and advance to the next programme step.

Figure 6: Application type

P _{RO}											
tYP						Ab					
1	2	3	4	5	6	7	8	9	10	11	12

Number of sections

This will determine the maximum number of sections available on the sprayer.

- ◀ In AB mode, only even values are allowed (2,4,6).
- ◀ In HC mode, all values between 1 and 7 are allowed.

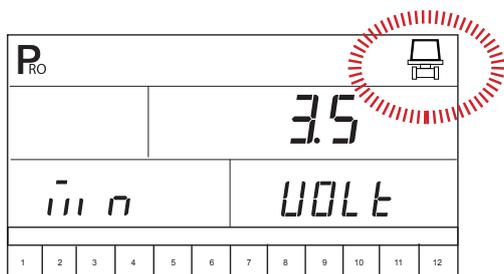
Figure 7: Number of sections

P _{RO}											
nr						4					
SEC											
1	2	3	4	5	6	7	8	9	10	11	12

Minimum voltage

This will determine the minimum voltage that can be applied to the regulation valve. If too low, the valve won't fine tune the dose rate. If too high, the valve could have some unstable regulation.

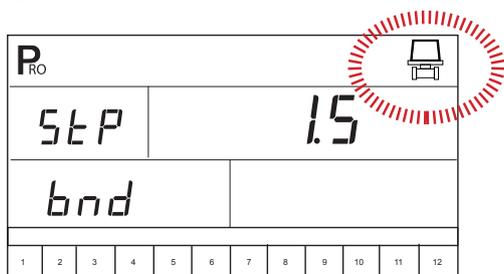
Figure 8: Minimum voltage



Deadband

This will determine the regulation dead band. This setting will avoid continuous regulation when the dose rate is very close to the target dose rate. If too low, the valve could have some unstable regulation. If too high, the real dose rate could be far away from the target.

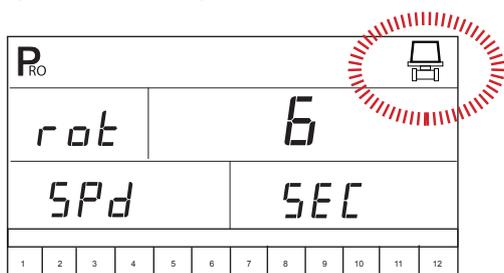
Figure 9: Deadband



Rotation speed

This will determine the time needed by the regulation valve to travel at maximum speed from fully close to fully open. This value must be set according to the specifications of the valve.

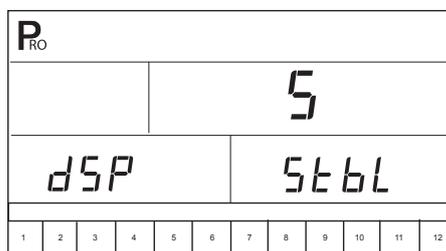
Figure 10: Rotation speed



Display stable

This will determine allowed tolerance percentage on the displayed dose rate. If the difference between the real and the target dose rates is smaller than it, the target will be displayed.

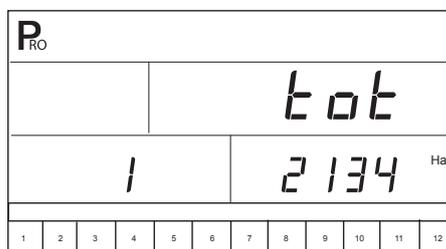
Figure 11: Display stable



Total area

This counter is a hidden counter that can be reset only by the manufacturer. It shows the total area covered since last reset.

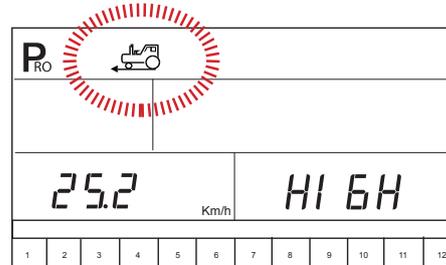
Figure 12: Total area



Maximum speed

This counter is a hidden counter that can be reset only by the manufacturer. It shows the maximum speed reached by the sprayer.

Figure 13: Maximum speed



Memory option

This feature enables the user counters.

Select NO to disable this feature or YES to enable it.

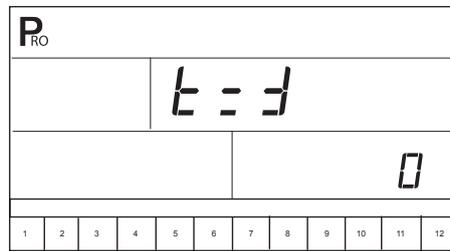
Figure 14: Memory option



Tank content

This feature enables a tank content counter. This counter should be set after filling the tank and will count down according to the sprayed volume. A zero value will disable this feature.

Figure 15: Tank content



CHAPTER 4 - SYSTEM SETUP

System setup mode contains the options that customize the controller to the sprayer or sprayer components. These include calibration steps and parameters that will rarely change once programmed.

Table 1: System setup mode sequence

Units of measurement	
Sensor selection	
Flow meter impulses	
Pressure transducer low pressure calibration (P Ref)	
Pressure transducer maximum rating (P HI)	
Speed sensor calibration*	Proximity/magnetic impulses
	Radar speed impulses
Simulated ground speed	
Reference flow rate per section	Select section
	Reference pressure
	Reference flow
	Repeat for section 2 to 12
Regulating valve response time	
Pressure regulating mode	
Minimum pressure setting	
Density (Liquid specific gravity)	
Communications	
Faces per section setting, Section 1 (HC Mode only)**	
Faces per section setting, Section 2 (HC Mode only)**	
Faces per section setting, Section 3 (HC Mode only)**	
Faces per section setting, Section 4 (HC Mode only)**	
Faces per section setting, Section 5 (HC Mode only)**	
Faces per section setting, Section 6 (HC Mode only)**	
Faces per section setting, Section 7 (HC Mode only)**	

* During speed calibration, the 844-AB will automatically sense whether a Wheel speed or Radar speed sensor is being used.

** The number of sections available is determined within the OEM setup options.

To enter System setup mode, press and hold the Plus (+) and Minus (-) keys simultaneously. While holding the Plus (+) and Minus (-) keys, also press the Programme (P) key twice (within 3 seconds) and then release all keys to enter System setup mode.

Press and hold the Programme (P) key for three seconds to exit System setup mode. Changes will be saved to the console's memory.

NOTE: The 844-AB console will not automatically power down during System setup mode. The system must be exited by holding the Programme (P) key for three seconds. A loss of power to the controller during System setup mode will erase all changes not previously saved to system memory.

Units of measurement

The 844-AB is capable of working in either US or SI (Standard international metric). Use the Plus (+) and Minus (-) keys to switch units. Press the Programme (P) key to accept the value and advance to the next programme step.

Figure 16: Units of measurement selection

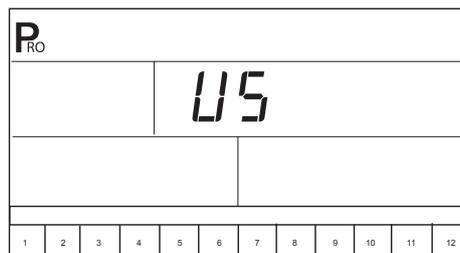


Table 2: Units of measurement

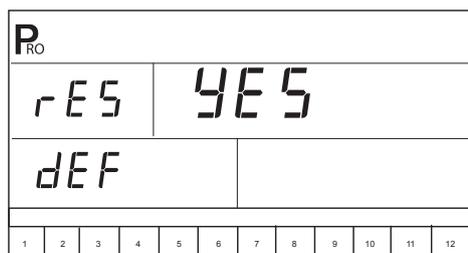
	US	SI
Speed	MPH (miles per hour)	Km/h (kilometres per hour)
Flow	GPM (gallons per minute)	L/min (litres per minute)
Area	Acres	Ha (hectares)
Pressure	PSI (pounds per square inch)	Bar
Volume	Gal (gallon)	L (litre)
Speed impulses	impulses/300ft (impulses per 300 feet)	impulses/100m (impulses per 100 metres)
Tree spacing	Inch	cm (centimetre)
Dose rate	GPA (gallons per acre)	L/Ha (litres per hectare)

Reset to default

If units of measurement changes were made, the console will display a message asking if programme parameters should be reset to default before advancing to the next screen. Use the Plus \oplus or Minus \ominus keys to select either “Yes” or “No” on the screen. Press the Programme P_{RO} key to accept the value and advance to the next programme step.

NOTE: If changes were not made to Units of measurement, this step will be skipped and the screen will advance to Sensor selection.

Figure 17: Reset to default



Sensor selection

The 844-AB can accommodate a flow meter, pressure transducer or both. Sensor selection instructs the console which sensor is being used on the sprayer. The default value is “FLO” (flow-based system) using a flow meter. To maintain this setting, press the Programme P_{RO} key to advance to Flow meter impulses. To change the setting to “PRS” (pressure based system), use the Plus \oplus or Minus \ominus keys to select “PRS”. Press the Programme P_{RO} key to advance to Flow meter impulses.

NOTE: Pressure-based regulation is used only with linear nozzles. For non-linear nozzles, ALWAYS select flow-based regulation. Most nozzles are linear and may be used with pressure-based regulation. ConeJet nozzles are non-linear.

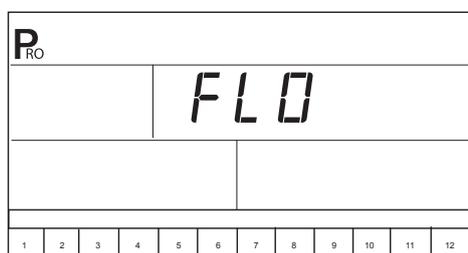
If both sensors have been installed on the sprayer, this step will determine which sensor will be used.

- ◀ If “FLO” is selected, the flow meter will be used to control flow and the pressure transducer will be used only to display actual pressure.
- ◀ If “PRS” is selected, the pressure transducer will be used to control flow and display the actual pressure. Flow meter signals will be ignored.

The regulation mode determines the following programme steps.

- ◀ If “FLO” is selected, the next Setup mode screen displayed will be the calibration step for the flow sensor (refer to Flow meter impulses).
- ◀ If “PRS” is selected, the next Setup mode screen displayed will be the calibration step for the pressure transducer (flow sensor calibration will be skipped).

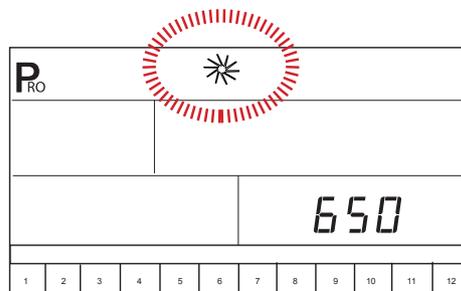
Figure 18: Sensor selection



Flow meter impulses

During the Flow meter impulses step, the \star symbol (flow meter turbine) will flash at the top of the console. The flow meter calibration number can be entered manually from the factory-calibrated flow meter pulse rate tag or an Auto calibration procedure can be activated to determine flow meter impulses based on a known volume of fluid.

Figure 19: Flow meter impulses



Manual entry

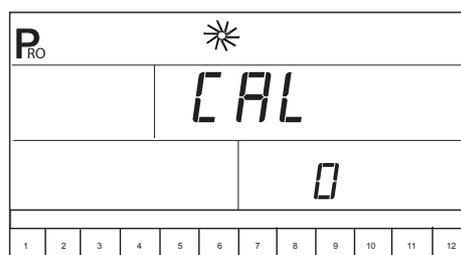
Locate the factory-calibrated flow meter pulse rate tag on the flow meter. If this varies from the default value (it usually does) of the console, use the Plus \oplus or Minus \ominus keys to modify the value.

In some cases, larger flow meters with small calibration numbers will include decimals for greater accuracy. To add a decimal to the calibration number, press the Auto/man A/M key.

Automatic calibration

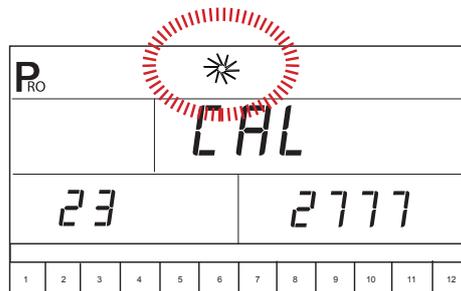
To complete an automatic calibration of the flow meter, press the Plus \oplus and Minus \ominus keys simultaneously. This will clear the existing value and initiate the calibration procedure. “CAL” will be displayed in the screen. This indicates that the controller is ready to begin the calibration process.

Figure 20: Calibration procedure



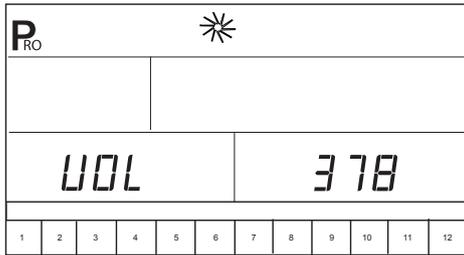
Engage the sprayer pump. Turn the boom sections “On” and begin spraying a known volume of fluid (e.g. 400 litres). As the known amount is sprayed, the console will count the impulses. After the known volume has been sprayed, turn the Master switch “Off” to stop counting impulses.

Figure 21: Calibration procedure



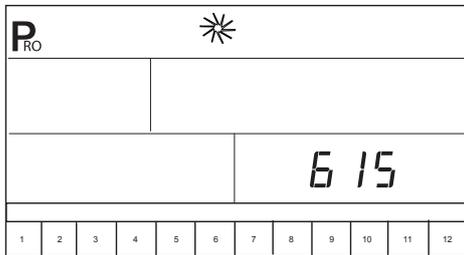
Press the Programme  key. The console will ask for the volume that was sprayed. Use the Plus  or Minus  keys to adjust the value to match the volume sprayed in litres.

Figure 22: Calibration procedure



Press the Programme  key to return to the Setup mode. The new flow meter calibration number will be displayed. To accept the value displayed, press the Programme  key again. To repeat the calibration procedure, repeat the previous steps.

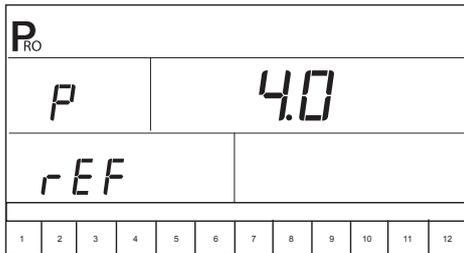
Figure 23: Calibration procedure



Pressure transducer low pressure calibration (P Ref)

The Pressure transducer low pressure calibration step is used to calibrate the “0” pressure setting of the pressure transducer. The pressure transducer used with the 844-AB uses a 4-20 mA reading (4.0 mA represents 0 pressure).

Figure 24: Pressure transducer low pressure calibration



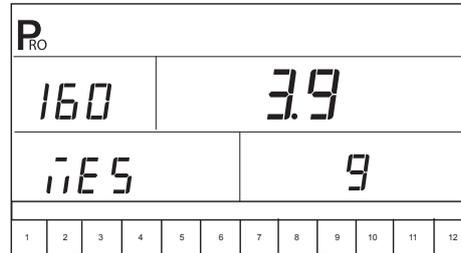
Manual entry

Use the Plus  or Minus  keys to modify the value.

Automatic calibration

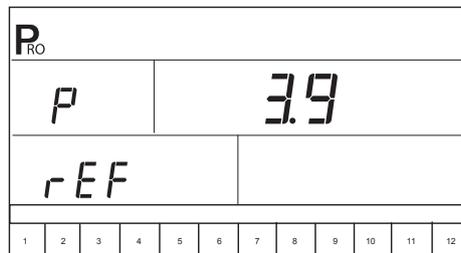
Make sure the sprayer pump is turned “Off” and there is no pressure in the system. Press and release the Plus  and Minus  keys simultaneously to activate the auto-calibration feature. The message “MES” will be displayed. A count of “0” to “9” will appear on the lower right portion of the screen.

Figure 25: Pressure transducer low pressure calibration



Once the display finishes counting, a number close to 4.0 (+/- 0.2) should be displayed. The low pressure value of the transducer is calibrated. Press the Programme  key to advance to the next step.

Figure 26: Pressure transducer low pressure calibration



NOTE: If a pressure transducer is not installed on the system, skip this step by pressing the Programme  key. Leave the default value at “4.0”.

Pressure transducer maximum rating (P HI)

The Pressure transducer maximum rating establishes the maximum rating of the pressure transducer. This number can be found stamped on the pressure transducer. If the transducer has a maximum rating of 10 bar and the number is shown on the display, advance to the next step by pressing the Programme  key.

If the maximum rating is 25 bar, use the Plus  or Minus  keys to change the value. Press the Programme  key to advance to the next step.

Figure 27: Pressure transducer maximum rating



NOTE: If a pressure transducer is not installed on the system, skip this step by pressing the Programme  key. Leave the default value at “10 Bar”.

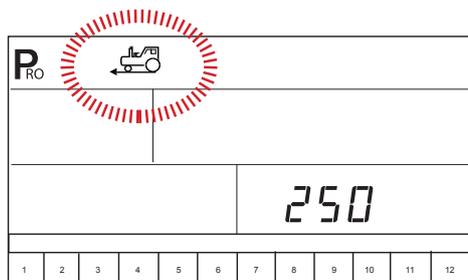
Speed sensor calibration

The speed sensor must be calibrated in order to provide the proper speed and area readings. The value is determined by the number of impulses generated by the speed sensor in 100 metres, or by manually entering the number.

NOTE: During speed calibration, the 844-AB will automatically sense whether a Wheel speed or Radar speed sensor is being used.

Proximity/magnetic impulses

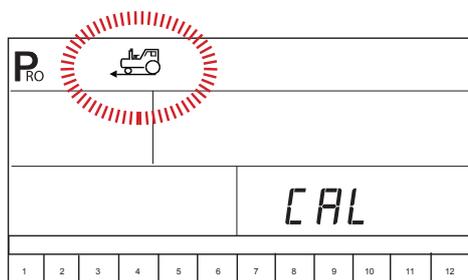
Figure 28: Proximity/magnet impulses



Automatic calibration

To automatically calibrate the speed sensor, mark a distance of exactly 100 metres. Press the Plus (+) and Minus (-) keys simultaneously to clear the contents of the display and activate auto calibration mode. "CAL" will be displayed on the lower right of the screen.

Figure 29: Speed sensor automatic calibration



Drive toward the initial point of the of designated 100 metres. At the starting location, press the Plus (+) key once to begin the calibration process. Continue driving the course. The 844-AB will count the impulses as the sprayer moves. The speed at which the vehicle travels is not important. As the ending point is reached, press the Plus (+) key again. The console will display the speed calibration number.

NOTES: The auto speed calibration process should take place in a field-like environment with the sprayer tank at least half full.

It is recommended to repeat the automatic speed calibration process at least twice and use an average of the speed calibration numbers.

Figure 30: Speed sensor automatic calibration



NOTE: Once the automatic speed calibration process has been activated, no other functions will operate until the console receives speed impulses for calibration. To deactivate automatic calibration mode, press the Plus (+) key twice.

During the automatic calibration process, the 844-AB will automatically sense whether a proximity/magnetic or radar ground speed sensor is installed. If a manual entry is preferred, refer to Manual calculation.

Manual calculation

To manually calculate the proper value for Wheel speed sensor impulses, the circumference of the wheel to which the sensor is mounted must be known. It can be measured by marking the tire and measuring the distance covered as the mark makes one full revolution. Once the number is known, use the following formula:

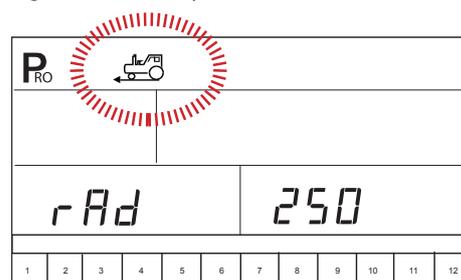
$$\frac{3600 \times (\# \text{ of magnets on wheel - typically } 2)}{\text{wheel circumference in inches}} \text{ i.e., } \frac{3600 \times 2}{30} = 240$$

$$\frac{10,000 \times (\# \text{ of magnets of wheel - typically } 2)}{\text{wheel circumference in cm}} \text{ i.e., } \frac{10000 \times 2}{80} = 250$$

The result can be entered instead of using the automatic calibration method. Use the Plus (+) or Minus (-) keys to adjust the value. Press the Programme (P) key to save the value and advance to the next programme step.

Radar speed impulses

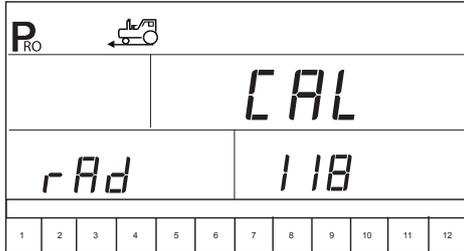
Figure 31: Radar speed sensor



Automatic calibration

To automatically calibrate the radar speed sensor, mark a distance of exactly 100 metres. Press the Plus (+) and Minus (-) keys simultaneously to clear the contents of the display and to activate auto calibration mode. Once auto calibration mode is activated, "RAD" will be displayed on the lower left of the screen.

Figure 32: Radar speed sensor automatic calibration



Drive toward the initial point of the designated 100 metres. At the starting location, press the Plus (+) key once to begin the calibration process. Continue driving the course. The 844-AB will count the impulses as the sprayer moves. The speed at which the vehicle travels is not important. As the ending point is reached, press the Plus (+) key again. The console will display the radar speed calibration number.

NOTES: The radar speed calibration process should take place in a field-like environment with the sprayer tank at least half full.

It is recommended to repeat the radar speed calibration process at least twice and use an average of the speed calibration numbers.

Manual calculation

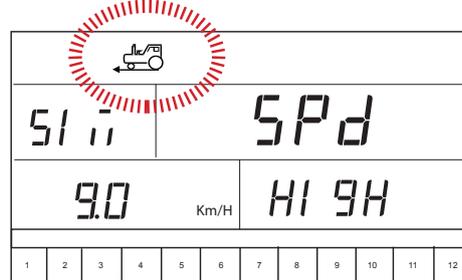
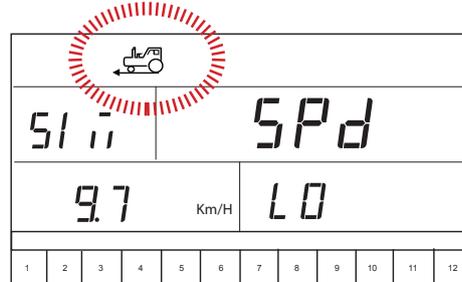
It is not possible to manually calculate the calibration value of a radar. However, the value can be entered manually if it is known from a prior calibration. To manually enter the radar calibration value, press the Auto/man (A/M) key to enter Radar mode. Once radar calibration mode is activated, "RAD" will be displayed on the lower left of the screen. Use the Plus (+) or Minus (-) keys to adjust the value. Press the Programme (P) key to save the value and advance to the next programme step.

Simulated ground speed

Simulated ground speed allows the console and sprayer to be tested (and actually spray water) without physically moving the sprayer. This can and should be tested prior to any spraying activity.

The 844-AB has a low and high simulated ground speed. This allows the operator to switch between the two to simulate a speed change and ensure the console is regulating properly during the sprayer checkout.

Figure 33: Simulated ground speed



To enter simulated speeds, determine whether the low or high simulated speed is displayed on the console. Change from low to high by pressing the Auto/man (A/M) key.

Use the Plus (+) or Minus (-) keys to adjust the values. Press the Auto/man (A/M) key to switch to the other setting (either low or high) and adjust the value with the Plus (+) or Minus (-) keys. Once both values are entered, press the Programme (P) key to advance to the next step.

The console will display the simulated speed upon exiting System Setup mode. The simulated speed will remain on the Operation mode display until the console receives actual speed impulses. While in Operation mode, with the Master switch in the "On" position, press the Programme (P) and Minus (-) keys for low simulated speed; press the Programme (P) and Plus (+) keys for high simulated speed.

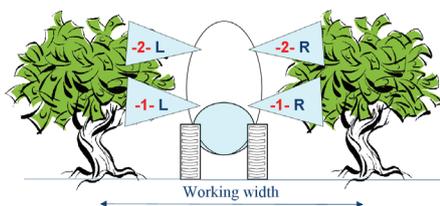
NOTES: The simulated speed feature will be deactivated once the sprayer begins moving and the 844-AB receives actual speed impulses. If a radar speed sensor is being used, disconnect the radar connection from the main console. Any movement can disable the simulated speed test due to the sensitivity of the speed sensor.

The LOW SIMULATED SPEED will be used during the first 3 seconds after Master is set in the ON position whatever the real forward speed. This will help starting a new row in the best conditions.

Reference flow rate per section

AB mode – The flow rate for each section of the sprayer must be input into the 844-AB console so that the necessary adjustments can be made when boom sections are shut off. The console is programmed to treat the left and right boom sections as symmetrical; therefore the console treats the flow rate for the lower left section (L1) identically to the flow rate of the lower right section (R1). The flow rate entered for section 1 will serve as reference flow for L1 and/or R1.

Figure 34: AB flow rate illustration



HC mode – The flow rate for a single nozzle must be input into the 844-AB console so that the necessary adjustments can be made when boom sections are shut off. If several different nozzles are mounted to spray on a face, they should be considered as ONE nozzle and the total flow should be programmed.

Figure 35: HC flow rate illustration



1. Select section

Up to twelve preset flow configurations can be entered into the 844-AB. The presets are represented by the numbers “1-12” at the bottom of the display. The arrow symbol indicates which preset is being programmed.

Select which preset flow configuration to programme. Use the Plus \oplus or Minus \ominus keys to toggle through the twelve presets.

Figure 36: Preset selection



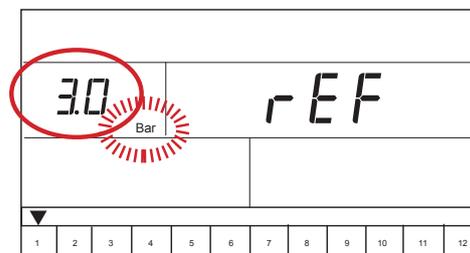
Press the Auto/man \leftrightarrow key to setup the reference pressure and reference flow of the selected preset.

Press the Programme P key to advance to the next programme step in System setup mode. It is not necessary to programme all twelve presets unless they are to be used. Programme the number of presets required. Press the Programme P key again to continue in System setup mode.

2. Reference pressure

Before entering the reference flow, determine the pressure at which the flow will be referenced. Use the Plus \oplus or Minus \ominus keys to adjust the value of the pressure Bar to be used as flow reference. The pressure selected to reference flow is not critical (any pressure can be used). Select a pressure that is close to normal operating pressure or select a pressure from the flow rate chart for the nozzles being used.

Figure 37: Reference pressure



Press the Auto/man \leftrightarrow key to advance to the reference flow for current preset section.

3. Reference flow

Calculate (add) the flow rates at the referenced pressure from all nozzles on the current preset section (left or right should be the same). Enter the total flow rate in litres/min. for the current preset section. Use the Plus \oplus or Minus \ominus keys to adjust the value.

Figure 38: Reference flow (Section one entry)



Press the Auto/man \leftrightarrow key to return to the select section option.

Next section

Repeat steps 1-3 for all sections as needed.

Figure 39: Reference flow (Section two entry)

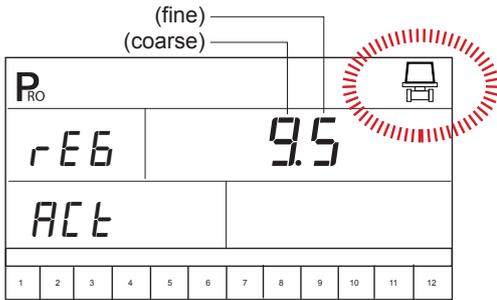


Once programming is complete for all presets, press the Programme P key to advance to the next programming step.

Regulating valve response time

Operating conditions may require a higher or lower response speed for the regulating valve. To change the response time number, use the Plus (+) or Minus (-) keys to increase or decrease the number. Any number between 0.0 and 9.9 may be selected (0=Slow; 9=Fast). The default value is 9.5. The first digit establishes the speed for coarse adjustments (when relatively far from the target rate). The second digit establishes the speed for the fine adjustment (when relatively close to the target rate). If the regulating valve is plumbed in a bypass line, the valve speed number of 9.5 works well for most applications.

Figure 40: Regulating valve actuating factor



If the regulating valve is plumbed in the throttling position (supply line), start with a valve speed of 3.0 and adjust the number according to application requirements. Adjusting agitation volumes can often assist the regulating valve operation. Press the Programme (P) key to accept the entry and advance to the next step.

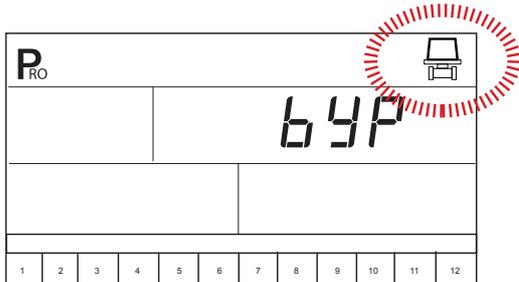
NOTE: The speed value can be adjusted to optimize system performance. If the valve tends to “search” for the programmed application rate by cycling the pressure up and down continuously, reduce the number until the “searching” is minimal or eliminated. A higher number will increase the valve response speed and increase the rate of adjustment.

Pressure regulating mode

Pressure regulating mode directs the 844-AB to the location of the regulating valve plumbing. Once established, this value should not change unless the regulating valve is physically moved to a new plumbing location. For additional information about plumbing, refer to the Plumbing and installation manual supplied with this kit.

The default value of bypass “BYP” indicates that the pressure regulating valve is plumbed in a bypass line. If no changes are necessary, press the Programme (P) key to accept the value and advance to the next step.

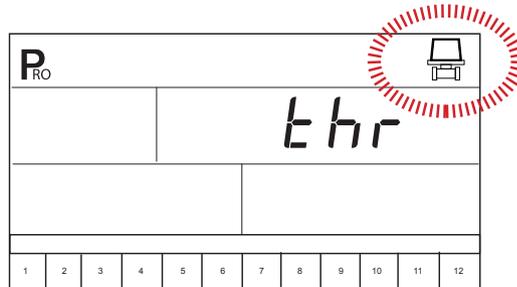
Figure 41: Pressure regulating mode (Bypass mode)



NOTE: Once the bypass mode is selected and the console is set to “manual” mode, the pressure regulating valve should close when the Plus (+) key is pressed and open when the Minus (-) key is pressed.

If the pressure regulating valve has been plumbed into in a supply line to the booms, it is considered a “throttling position”. Use the Plus (+) or Minus (-) keys to change the displayed value to “THR” (throttling mode). By doing this, the polarity that the console uses to control the regulating valve will be reversed.

Figure 42: Pressure regulating mode (Throttling mode)



NOTE: Once the throttling mode is selected and the console is set to “manual” mode, the pressure regulating valve should open when the Plus (+) key is pressed and close when the Minus (-) key is pressed.

Press the Programme (P) key to accept the entry and advance to the next step.

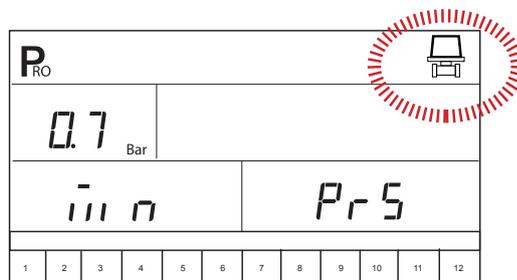
Minimum pressure setting

The Minimum pressure setting establishes the minimum pressure the sprayer will regulate. When the vehicle slows down, the control system will sometimes regulate the pressure so low that it falls below the manufacturer’s recommended pressure for the spray nozzle. It may also reduce system flow to the point where the flow meter will stall.

To avoid these situations, the 844-AB can be programmed to avoid regulating below the pressure established with this setting. If the default setting of 0.7 bar is used, the pressure will not fall below 0.7 bar while spraying in automatic mode.

Use the Plus (+) or Minus (-) keys to adjust the value. Press the Programme (P) key to advance to the next programme step.

Figure 43: Minimum pressure setting



Density (Liquid specific gravity)

The default value of “1.00” corresponds with the specific gravity of water and is correct for most pesticide applications. Some spray solutions, such as fertiliser, have different densities. If such a material is being used, a new value should replace the default.

Figure 44: Density display



Use the Plus \oplus or Minus \ominus keys to change the value. Press the Plus \oplus and Minus \ominus keys simultaneously to clear the value to “0”. Press the Programme P key to accept the value and advance to the next step.

The following chart will help determine the density of other solutions.

Table 3: Density settings

Weight of solution per		Specific Gravity
Gallon	Litre	
7.0 lb	0.84 Kg	0.84
8.0 lb	0.96 Kg	0.96
8.34 lb (water)	1.00 Kg	1.00
10.0 lb	1.20 Kg	1.20
10.65 lb (28% N)	1.28 Kg	1.28
10.85 lb (30% N)	1.30 Kg	1.30
11.0 lb	1.32 Kg	1.32
12.0 lb	1.44 Kg	1.44
14.0 lb	1.68 Kg	1.68

If the solution is not identified on the chart (above), the Specific gravity can be calculated as follows:

- Water weighs 1 Kg/L.
- To activate the specific gravity number while in the Application setup mode, press the Auto/man A/M key so “D” is displayed on the top of the screen. All calculations will use the specific gravity entered during this step. To remove the “D” press the Auto/man A/M key again. Once the “D” is not displayed, all calculations will use the specific gravity of water (1.00) regardless of whether another density was programmed or not. Refer to Application setup mode for additional information.

Communications

If the 844-AB has been upgraded and is communications compatible, a variety of communications options can be entered. Choices available include the default of no communications “no com”, contractor printing “cnt prt”, user printing “usr prt”, global positioning system communications capability “gps”, downloading to a pc ‘on-the-go’ capability “log” or PC link “pc” (not used).

Figure 45: Communications settings



If the 844-AB has not been upgraded with the communication package, no change is required. If a change is necessary, press the Plus \oplus or Minus \ominus keys to select the type of communication used. Press the Programme P key to accept the value and advance to the beginning of System Setup mode.

Faces per section setting (HC mode only)

As HC mode calculates working width based on the number of faces sprayed by each section. Additional steps are required to setup these values.

Figure 46: Section 1 Faces settings



Use the Plus \oplus or Minus \ominus keys to adjust the value. This step will repeat for each section. Press the Programme P key to advance to the next section. The number of sections available is determined within the OEM setup options.

Figure 47: Section 7 faces settings



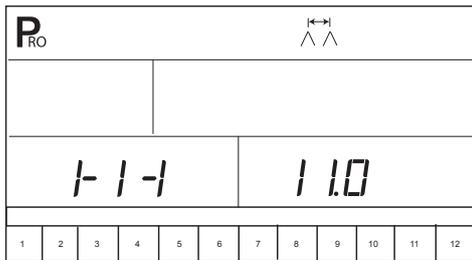
After cycling through all sections, press the Programme P key to advance and return to the first programme step.

CHAPTER 5 - SWATH WIDTH PRESETS

The 844-AB can be programmed with up to 6 swath widths. This allows the operator to easily change from one swath to another during application. (This is essential when spraying orchards that have varying swath widths.)

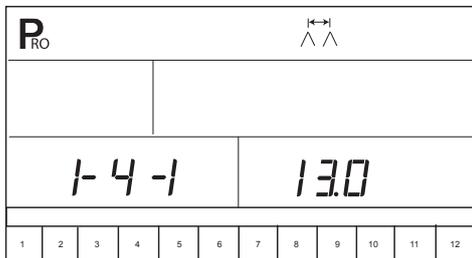
To enter Swath width presets mode, press and hold the GREEN button for 3 seconds. The swath width setting screen for preset number 1 will be displayed. The swath width is displayed on the lower right of the console (measured in metres for SI [metric] units).

Figure 48: Entering swath width presets



Use the Plus (+) and Minus (-) keys to adjust the value for the first swath preset. Press the GREEN button or the Programme (P) key to advance to the next swath preset. Use the Plus (+) and Minus (-) keys to adjust the swath value. Continue this process through the six possible presets. If all six presets are not required, enter values only for the necessary number of presets. All others should be set to "0". Values set to "0" will not be available for selection. Once the presets have been entered, press the GREEN button or the Programme (P) key to return to the Operations mode.

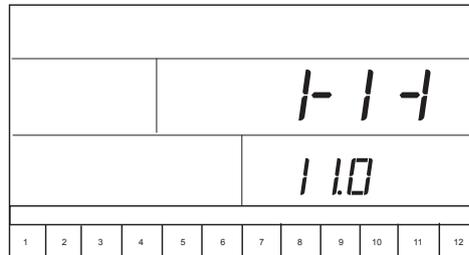
Figure 49: Entering swath width



Selecting swath preset

Once the swath widths are programmed, select the swath width to be used by pressing the GREEN button during Operations mode. The console will display which swath preset is being used. If the preset displayed is correct, press the Programme (P) key to return to Operations mode.

Figure 50: Swath width selection



Should a different swath preset be desired, press the GREEN button again to advance to the next swath selection. Continue to press the GREEN button until the appropriate swath preset is displayed. Press the Programme (P) key to select the preset and return to Operations mode.

NOTE: When toggling through swath width selections, only those with presets programmed will be displayed (if presents 5 and 6 are set to "0", they will not be displayed).

CHAPTER 6 - APPLICATION SETUP

Application Setup mode contains the most frequently changed setup parameters (target application rate and nozzles used). TeeJet has added this separate setup mode to speed the programming process when minor changes are made during operation (e.g., changing orchards, switching nozzles, changing crops, etc.).

To enter Application Setup mode, while in Operations mode press the Programme  key twice (within 3 seconds). One press of the Programme  key will display “PRO USER,” indicating the console is about to enter Application Setup mode. If the Programme  key is pressed inadvertently, the console will display “PRO USER” for three seconds before returning to Operations mode. Pressing the Programme  key a second time within 3 seconds will enter Application Setup mode.

Figure 51: Entering application setup

PRO											
USER											
1	2	3	4	5	6	7	8	9	10	11	12

Table 4: Application setup mode sequence

Preset flow rate selection	
Nozzles per face	
Target application rate	
Calculation diagnostic	Adjust pressure
	Adjust speed
Liquid density	

Preset flow rate selection

The  symbol will flash at the bottom of the screen. The numbers 1-12, also located at the bottom of the screen, represent the 12 preset dose rates. Use the Plus  and Minus  keys to toggle through the presets and select the appropriate one for application. Press the Programme  key to advance to the next step.

Figure 52: Preset flow rate selection

PRO											
4.1 Bar											
90.0 L/Ha											
8.7 Km/H											
4											
1	2	3	4	5	6	7	8	9	10	11	12

Nozzles per face

NOTE: If AB mode has been selected, this step will be skipped and the screen will advance to Target application rate step.

The nozzle symbol will flash during the Nozzle per Face step. Press the Plus  or Minus  keys to adjust the value. Pressing the Plus  or Minus  keys simultaneously will clear the value to “0”. Press the Programme  key to advance to the next step.

Figure 53: Nozzles per face

PRO											
6.8 Bar											
90.0 L/Ha											
6.9 Km/H											
4											
1	2	3	4	5	6	7	8	9	10	11	12

Target application rate

The application rate units (e.g., L/Ha) will flash during the Target application rate step. Press the Plus  or Minus  keys to adjust the value of the target application rate. Pressing the Plus  and Minus  keys simultaneously will clear the value to “0”. Press the Programme  key to advance to the next step.

Figure 54: Target application rate

PRO											
6.8 Bar											
90.0 L/Ha											
6.9 Km/H											
4											
1	2	3	4	5	6	7	8	9	10	11	12

Calculation diagnostic

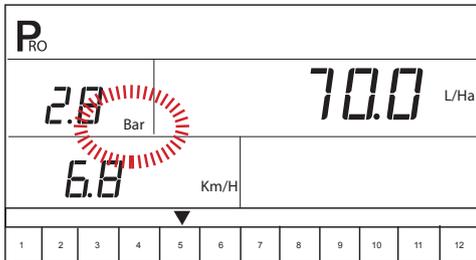
NOTE: This step is used for diagnostic purposes only. It has no effect on the operation of the 844-AB.

This diagnostic tool will allow the operator to adjust the indicated pressure to see what affect, if any, it would have on operating speed. The operator can also adjust the speed to see what pressure is required to maintain the target application rate. This process will help determine if the correct nozzle configuration was chosen for the application. While in the calculation step, either the pressure or speed units will flash.

Adjust pressure

If an approximate operating pressure is known, use the Plus \oplus or Minus \ominus keys to adjust the value. The 844-AB will determine what operating speed is required to achieve the target application rate at the entered pressure. If the speed is too high, a set of smaller nozzles is necessary. If the speed is too low, a set of larger nozzles is necessary.

Figure 55: Adjust pressure



Adjust speed

If an adjustment to the speed setting is required, press the Programme P key once. The speed units will flash. Use the Plus \oplus or Minus \ominus keys to adjust the speed to the desired value. The 844-AB will calculate the required pressure to maintain target application rate at the entered speed. If the pressure is too high, a set of larger nozzles is necessary or the speed must decrease. If the pressure is too low, a set of smaller nozzles is necessary or the speed must increase.

Figure 56: Adjust speed



Liquid density

To activate the Liquid density setting, press the Auto/man A key. The D symbol will be displayed at the top of the screen. The Liquid Density that is programmed into the console will also be displayed. To change density, press the Plus \oplus or Minus \ominus keys. Press the Programme P key to accept the changes and return to the current application setup step. The calculations will use the Specific gravity (Density).

To revert back to the calculation based on spraying water, press the Auto/man A key.

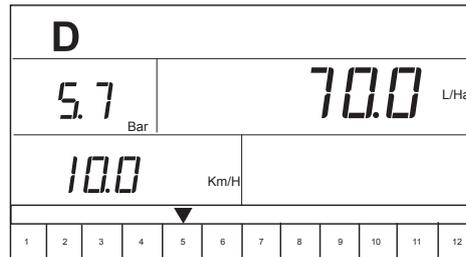
Figure 57: Liquid density



NOTE: If a liquid with a density other than water will be sprayed, and that density was programmed into the Specific gravity (Density) step during System setup mode, the "D" symbol must be selected during Application setup mode to activate the alternate density.

Press the Auto/man A key during Application setup mode to activate the alternate density. A "D" will be displayed at the top of the console to indicate the alternate density is active. This must be displayed so that all calculations will use the alternate density during operations. If the "D" is not at the top of the display, calculations will be based on water (1.00).

Figure 58: Liquid density



After performing the calculations, advance to the beginning of Application Setup mode to make changes by pressing the Programme P key. If no changes are necessary then Application setup mode is complete. Press and hold the Programme P key for three seconds. Changes to Application setup mode will be stored in the console's memory.

NOTE: The 844-AB console will not automatically power down during Application setup mode. The system must be exited by holding the Programme P key for three seconds. A loss of power to the controller during Application setup mode will erase all changes not saved to system memory.

CHAPTER 7 - OPERATIONS

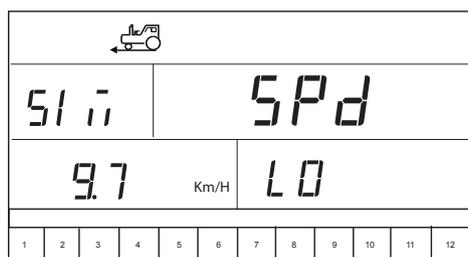
Before operating, check connections related to the Sprayer control assembly. The sensors should be checked to ensure the console receives uninterrupted signals.

IMPORTANT! When work occurs around a sprayer/farm chemicals, wear protective clothing and eye wear. Partially fill the sprayer tank with water to flush the system. Perform an inspection of the spray nozzles to ensure they are spraying the correct pattern.

The Master Boom Switch should be in the "Off" position. Perform the following steps prior to application:

1. Ensure the tank shut-off valve is "Open".
2. Start the engine, engage the pump and set the RPM to the level to be used during application.
3. Power on the 844-AB by pressing the Programme  key.
4. Ensure the preset reference flow number matches the nozzles being used.
5. Ensure the console recognizes simulated speed. If the simulated speed has been disabled due to movement of the sprayer, press the Programme  and Plus  keys to activate the high simulated speed. Press the Programme  and Minus  keys to activate the low simulated speed.

Figure 59: Simulated speed (Low)



6. Power "ON" the toggle switches for each spray boom section.
7. Press the Auto/man  key so the red LED light indicates "MAN" mode.
8. Toggle the Master boom switch to "ON".
9. Adjust the pressure with the Plus  and Minus  keys. The pressure should increase with the Plus  key and decrease with the Minus  key. During adjustment, the sprayer will be active so spray nozzle performance can be visually monitored.
10. Press the Auto/man  key so the red LED light indicates "Auto" mode. The 844-AB should adjust to the appropriate target application rate for the simulated speed.
11. Press the Programme  and Plus  keys simultaneously during spraying to switch the console to "high" simulated speed. The 844-AB should adjust to the appropriate target application rate for the simulated speed.
12. Press the Programme  and Minus  keys simultaneously during spraying to switch the console to "low" simulated speed. The 844-AB should adjust to the appropriate target application rate for the simulated speed.

Toggle the Master boom switch to "OFF" to stop spraying.

NOTE: It is recommended that the entire sprayer be calibrated in preparation for operation and to diagnose wear to spray nozzles. Worn nozzles can contribute to costly chemical waste and inaccurate spraying regardless of sprayer control use. Calibration is important to obtain the benefits associated with computerized sprayer control.

Spraying

Fill the sprayer tank and mix the chemical(s). The application rate should already be programmed, as well as the spray nozzle size.

1. Power on the 844-AB by pressing the Programme  key.
2. Toggle the appropriate individual boom switches to the "ON" position.
3. Press the Auto/man  key so the red LED light indicates "Auto" mode.
4. With the Master boom switch in the "OFF" position, the target application rate and the target symbol will be displayed on the console.
5. With the Master boom switch in the "ON" position, the actual application rate will be displayed and the target symbol will no longer appear. The console will display the actual application rate, vehicle speed, application area covered/total volume applied and pressure (if a pressure transducer has been installed).
6. Turn the Master boom switch to the "On" position as the area to apply is entered. Spraying will begin.
7. Maintain vehicle speed for spraying. Moderate changes in vehicle speed will not affect the application rate (changes are compensated by automatic pressure increases or decreases).

To stop spraying, turn the Master boom switch to the "OFF" position. Alarm warnings may occur momentarily while the pressure regulating valve searches for a new setting (i.e. after the close of a boom section or other changes in normal operation). However, if the alarm continues for a longer time, the valve may have reached its limit and the system will be unable to regulate flow correctly.

CHAPTER 8 - FEATURES

Boost mode

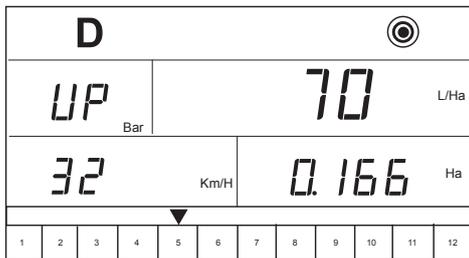
Increased or decreased chemical application may be required during certain areas of application. The Plus \oplus and Minus \ominus keys allow for easy adjustment. Boost mode can be activated while spraying during "Auto" mode by pressing either the Plus \oplus or Minus \ominus keys once. With each subsequent press of the Plus \oplus key, the application rate will increase by 10%. With each subsequent press of the Minus \ominus key, the application rate will decrease by 10%.

If the Plus \oplus or Minus \ominus key is pressed inadvertently during operation, a delay of three seconds will deactivate Boost mode. Succeeding presses will change the target rate in 10% increments to a maximum of +/- 90% of the target rate.

Example: To increase the application rate by 10%, press the Plus \oplus key once to activate Boost mode. Press the Plus \oplus key again to initiate a 10% increase. To decrease the application rate by 10%, press the Minus \ominus key once to activate Boost mode. Press the Minus \ominus key again to initiate a 10% decrease.

Application rate changes are monitored on the display as they occur. The console will display "UP 10", "UP 20", "DN 20", "DN 30", etc. for approximately three seconds before returning to actual application rates.

Figure 60: Boost mode



To return the application rate to the original target rate, use the Plus \oplus or Minus \ominus keys individually to increase/decrease the rate in 10% increments, or press the Plus \oplus and Minus \ominus keys simultaneously to return to the programmed target application rate.

NOTE: During boost mode, the target symbol will flash at the top of the console to indicate the sprayer is not operating at the target application rate.

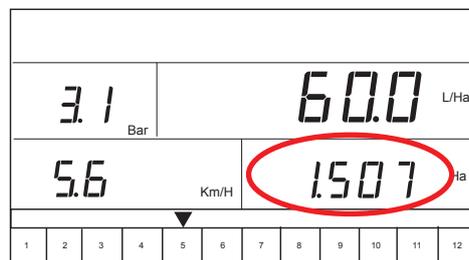
Area/volume display

The 844-AB records application area and measures the total volume applied while the Master boom switch is in the "ON" position. The area counter measures treated hectares and is dependent on the value programmed for swath width. The volume measured is dependent on flow meter impulses and is available on flow-based models only.

The console will alternately display the treated area sprayed and the total volume applied (litres) since the last time the area counter/volume measure was cleared.

To clear the area counter/volume measure, press and hold the Plus \oplus and Minus \ominus keys simultaneously for three seconds. The area/volume measure can only be cleared during Operations mode with the Master boom switch in the "Off" position.

Figure 61: Area/volume display



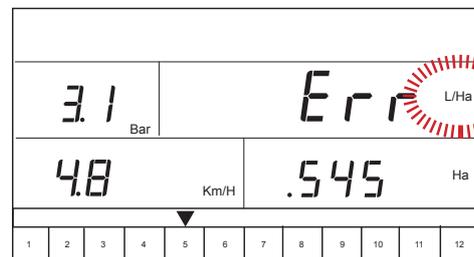
NOTES: The area counter/volume measure works only when the Master boom switch is in the "On" position.

If a pressure-based controller is being used, the volume feature will be disabled. The total area will be displayed at all times.

Application alarm

If the 844-AB detects a continuous discrepancy of 10% or more between the Target application rate and the Actual application rate, the application rate units (L/Ha) will flash in the display window. This will alert the operator to a problem with the plumbing, operation or programming.

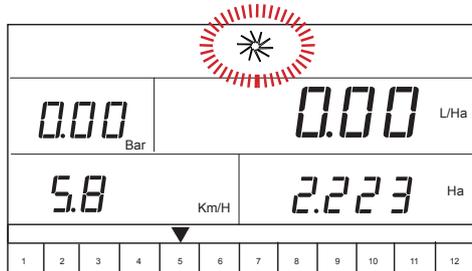
Figure 62: Application alarm



No flow alarm

If the 844-AB stops receiving impulses from the flow meter, the turbine symbol will flash at the top of the display. This indicates that there is a problem with the flow meter or elsewhere in the system. This alarm will occur only when the Master boom switch and at least one boom toggle switch are set to the “ON” position.

Figure 63: No flow alarm



Automatic power down

The 844-AB console is designed to power off after 10 minutes of inactivity. This feature prevents the console from draining the battery on the sprayer if the operator inadvertently leaves the console powered on for an extended period. This feature is only enabled when the Master boom switch is turned “Off” and the console is not receiving inputs from any of the sensors (the sprayer is inactive).

To manually power down the console, refer to Power off the console.

NOTE: The Automatic power down feature will be disabled any time the console enters into any programme mode. Programme modes must be exited first before powering down to ensure all information is saved to the console’s memory.

Printing

The printing feature is only available on 844-AB consoles that have been upgraded with the communications package. The 844-AB communications package is available through authorized TeeJet Technologies suppliers.

The printout generated by the 844-AB contains information collected from 844-AB memory. To ready the 844-AB for printing, refer to Communications in System Setup mode and select either “user prt” or “cn prt” depending on which report is desired. Exit the mode by pressing and holding the Programme  key for three seconds.

Connect a standard serial port printer to the 844-AB console and make sure that the printer LED’s are lit, indicating that the printer has power. Ensure that the console is in Operations mode and the Master boom switch is set to “Off”. Press and hold the Minus  key for three seconds to begin printing. To reset the values to zero, press and hold the Plus  and Minus  keys simultaneously for three seconds.

NOTE: Printing is available only to those 844-AB consoles that have been upgraded with the COMMUNICATIONS PACKAGE. To determine 844-AB console printing capabilities, examine the left end plate of the console. A communications-ready console will have an RS-232 pin connector attached to the left end plate. If the end plate has no connector, the console has not been upgraded and cannot print.

844AB

SPRAYER CONTROL

U S E R G U I D E M A N U A L



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