

**micron**  
S P R A Y E R S

SPRAYER CONTROLLER  
**Operation**

RDS Part.No.:	S/DC/500-10-352
Doc. Issue:	1 : 2/7/02
Software Issue:	PS808-000 rev.6

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## Electromagnetic Compatibility (EMC)

This product complies with Council Directive 89/336/EEC when installed and used in accordance with the relevant instructions.

### **IMPORTANT, READ THIS BEFORE USING THE INSTRUMENT**

The installation is a part of the Precision Farming System ("the System"). It is very important that you follow the described calibration procedures before operating the instrument. Calibration and operation of the instrument must be in accordance with these instructions. Use of the System is subject to the following disclaimer;

- 1. So far as is legally permissible RDS Technology ("RDS"), or its distributors, shall not be liable, whatever the cause, for any increased costs, loss of profits, business, contracts, income, or anticipate savings or for any special, indirect or inconsequential damage whatsoever (death or personal injury excluded).*
- 2. The capabilities and functions of the Precision Farming System ("the System") are limited as set out in the specification of the System, details of which are contained in the Help files and product literature and which must be read before using the System.*
- 3. Without prejudice to the generality of the above it is hereby acknowledged that the System is not designed nor intended to a) originate variable treatment plans or b) achieve or avoid any application rate outside application parameters, which in both cases shall be the responsibility of the operator.*
- 4. The standard terms and conditions of RDS (except clause 7), a copy of which is available on request, apply to the supply and operation of this System.*

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Our policy is one of continuous improvement and the information in this document is subject to change without notice. Check that the software reference matches that displayed by the instrument.

\\UK352-1.DTP

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# 1 Overview

*This manual covers the operation of the Micron Sprayers Variable-Rate Spray Controller.*

## 1.1 General Description

The "Micron Sprayers" Controller is a DGPS compatible, multi-function cab computer based on the RDS Apollo Sprayer Controller, and is fully compatible with the range of RDS Precision Farming hardware. It enables a wide range of flow rates to be applied while maintaining a given spray quality, by the use of dual spray lines each of which has a different size spray nozzle fitted.

The instrument determines the required flow rate for a required application rate, and automatically switches either one or both spray lines according to the nozzles types fitted. It then regulates the pressure to achieve the target application rate.

## 1.2 Sprayer Control Modes

The instrument has three control modes;

### Manual Control Mode

This gives simple manual control of application rate. Field data ("job memos") can be logged and stored in the instrument memory. Field data ("job summaries") can be logged and are stored in the instrument memory. Up to 75 summaries can be stored.

### Automatic Control Mode

This gives fully automatic rate control. Flow / pressure is automatically regulated as forward speed varies, to ensure that the actual application rate constantly matches a preset target rate. The application rate can be manually nudged up and down from the target rate as required for spot application in specific areas. Programmable alarms warn of high and low flow rates.

Field data ("job summaries") can be logged and are stored in the instrument memory. Up to 75 summaries can be stored. If you have a GPS receiver and RDS Data Card Module connected, as well as creating a job summary, you can also log the vehicle route and application data to a "dynamic log" file on the PCMCIA card. The job summary data is also appended to this file, which can be viewed in PLOT/PLAN.

### VRT (Variable-rate treatment) Control Mode

This enables the system to be controlled via treatment instructions prepared using RDS PLOT/PLAN or similarly capable Precision Farming software programs, in conjunction with DGPS position data. To enable fully automatic variable-rate treatment for Precision Farming applications, the instrument requires a suitable DGPS receiver and the RDS PCMCIA Card Module to implement treatment plans generated in RDS PLOT/PLAN.

A work record file is automatically created on the card module to log data confirming the actual treatment. The job summary data is also appended to this file, which can be viewed in PLOT/PLAN.

*Please refer to the 'Precision Farming Supplement' Pt No. S/DC/500-10-202 for details of DGPS installation, setup and data transfer with the Data Card Module.*

## 1.3 Calibration Mode

The instrument must be calibrated before commencing normal operation. Many settings are made only on initial installation. Other calibration settings may need to be altered according to the liquid being sprayed, nozzle types being used etc.

*Please refer to the 'Calibration manual' supplied with your instrument.*

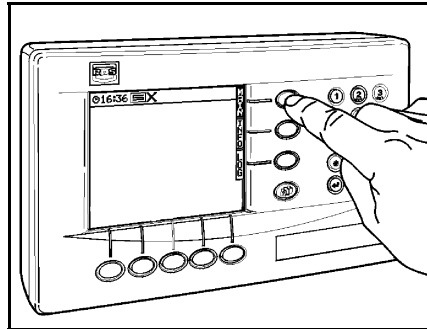
## 1.4 The Operating Screens

### 1.4.1 Menu keys

All instrument functions are accessed by nine menu keys adjacent to the LCD display.

**Figure 1**

The functions are controlled via the menu keys next to the display



The four menu keys to the right of the screen (figure 1) access the primary screen pages (those viewed during normal operation). There are three primary screens MAIN, INFO and LOG for normal operating functions, and a SETUP screen for calibration functions.

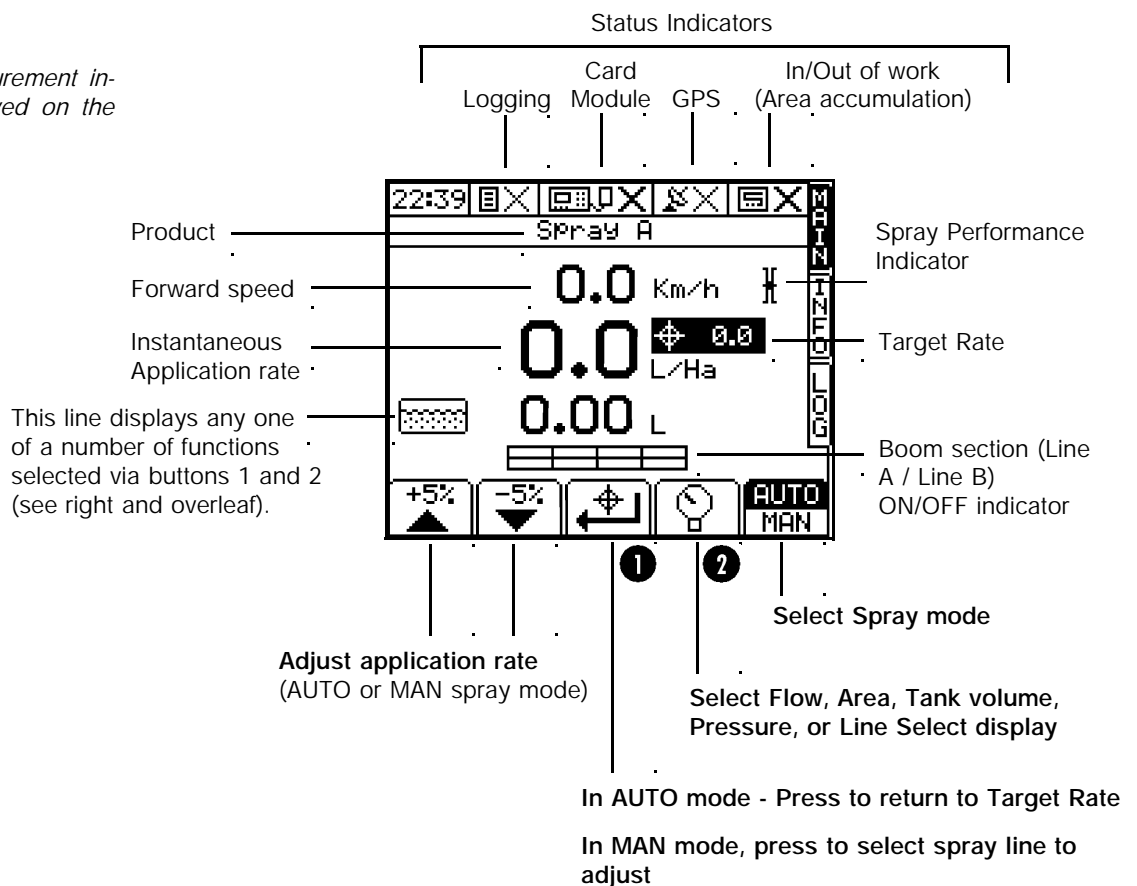
The five sub-menu keys below the screen control the various display functions and settings for each of the primary screen pages. Text or icons are displayed adjacent to the sub-menu keys to denote their function.

### 1.4.2 The MAIN screen page (Work Measurement Information)

The instrument will always default to the MAIN screen on startup. The MAIN screen displays the following information (figure 2). Pressing the MAIN key switches between this screen and more detailed Line Select/Flow information (see 1.4.6).

**Figure 2**

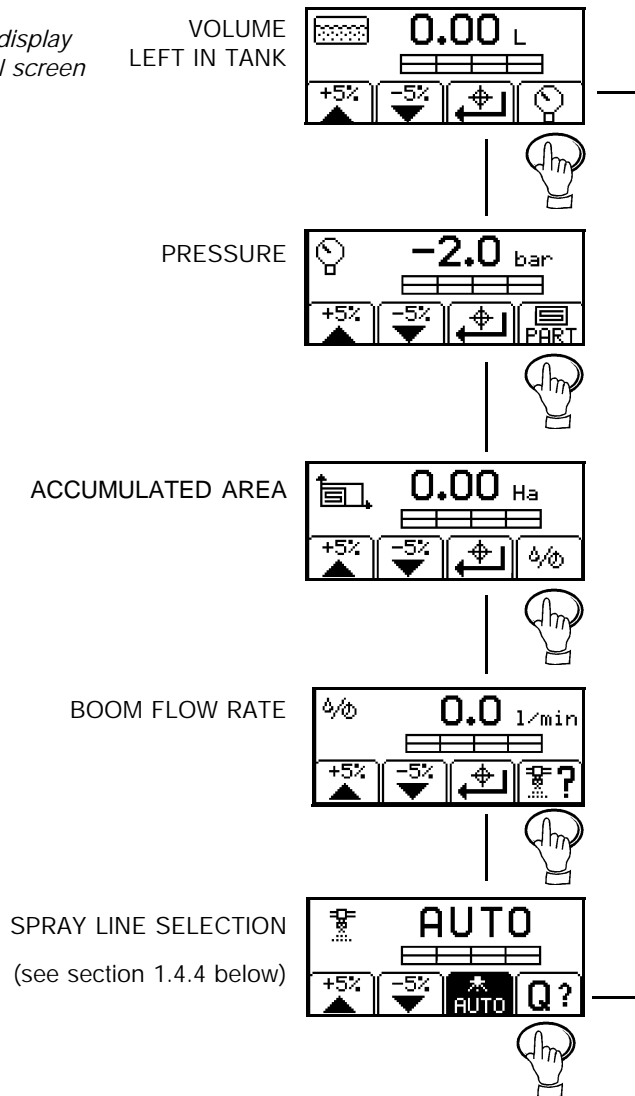
The Work Measurement information displayed on the MAIN screen



### 1.4.3 MAIN screen Display Options

You can select which function is displayed on the third line of the MAIN screen. Press the sub-menu key (fig.3) to cycle through the following functions:

**Figure 3**  
Cycling through the display options on the MAIN screen



When in AUTO control mode, the centre button ( ) is pressed to return the application rate back to the target rate (except when the "Spray Line Selection" function is displayed - section 1.4.4).

### 1.4.4 Spray Line Selection (in AUTOMATIC application mode)

In normal operation in AUTO application mode, both spray lines are under automatic control (fig. 4a). As the forward speed increases or decreases, the system decides which line(s) are in operation in order to maintain the programmed application rate and optimum spray quality.



*Fig. 4a The system selects the spray line(s) automatically*

You can override the full "AUTO" spray line setting if, for example, localised conditions require you adjust the spray quality.

Because the instrument is set in AUTO application mode (indicated by the icon), the system will continue to regulate automatically to maintain the target application rate - the difference being that you and not the instrument, determine which spray line(s) are in use.

Press the centre button to select manual override of the spray lines "A", "B" or "A+B".

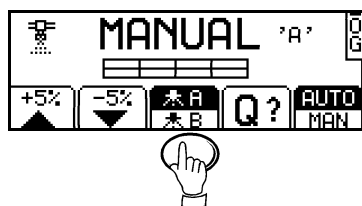


Fig. 4b Forces system to use line A only.

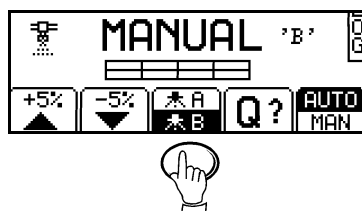


Fig. 4c Forces system to use line B only.

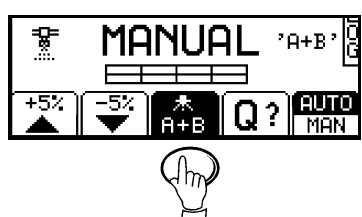



Fig. 4d Forces system to use both lines.

Remember, even with manual selection of the spray lines the system still regulates to the target application rate automatically, although the actual application rate and spray quality may be constrained by the nozzles in use. You can continue to select another display option (1.4.3) and the spray line selection remains at the chosen setting until you change it again.

#### 1.4.5 Spray Line Selection (in MANual application mode)

In normal operation in MAN application mode, both spray lines are under automatic control (fig. 4e). The system will select the appropriate line(s) to use according to the nozzle data in the "Nozzle Wizard" and the application rate manually set.

Because the system is being manually regulated (indicated by the  icon), the system will spray from that line (or both lines) irrespective of changes in forward speed, and will only change lines when you manually change the application rate.

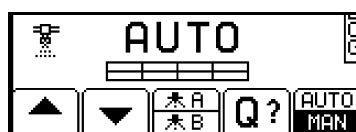


Fig. 4e Instrument selects spray lines automatically according to the manual rate setting

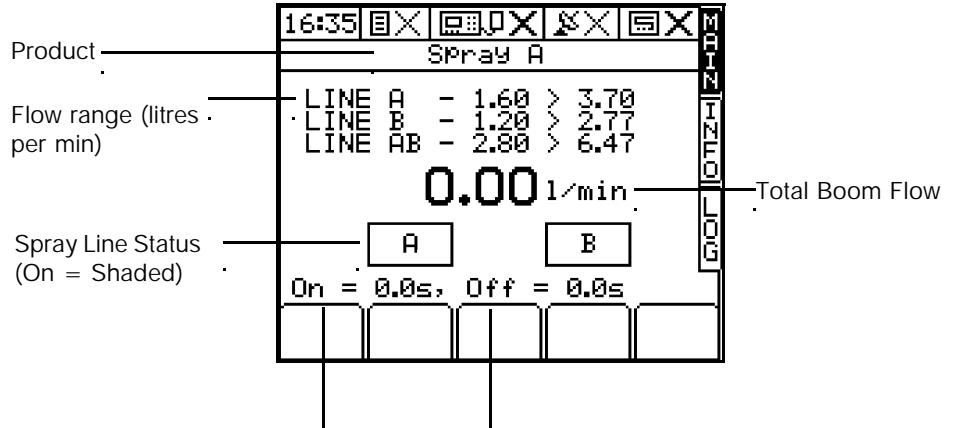
In the same way as in AUTOMATIC application mode, you can override the "AUTO" spray line setting if, for example, localised conditions require you adjust the spray quality.

Press the centre button to select manual override of the spray lines "A", "B" or "A+B". This forces the system to use the selected line(s) irrespective of the manual rate setting / "Nozzle Wizard" data.

### 1.4.6 The MAIN screen (Flow Information)

Pressing the MAIN key switches between this screen and the default Work Measurement screen that appears on startup (1.4.2).

**Figure 5**  
The MAIN screen showing flow information



Time delay settings - these assist in smoothing the overall flow rate when the system switches spray lines, in order to maintain a constant application rate and spray quality:-

"On" - switching from spray line A to B (increasing flow)

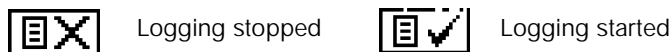
"Off" - switching from spray line B to A (increasing flow)

The time delay settings will depend on the particular sprayer. If you perceive excessive fluctuation in the delivery rate during the line change over, the general advice is to gradually increasing the delay times (in small steps) and observe the result. For further advice, please contact your local Micron Sprayers representative who will be pleased to assist.

### 1.4.7 Status Indicators

The row of icons at the top of the page show the following;

(i) if logging is in progress or not :-



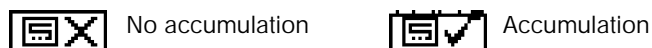
(ii) if the Card Module is connected and whether a card is inserted :-



(iii) if a GPS signal is being received :-



(iv) if the area / distance is being accumulated :-

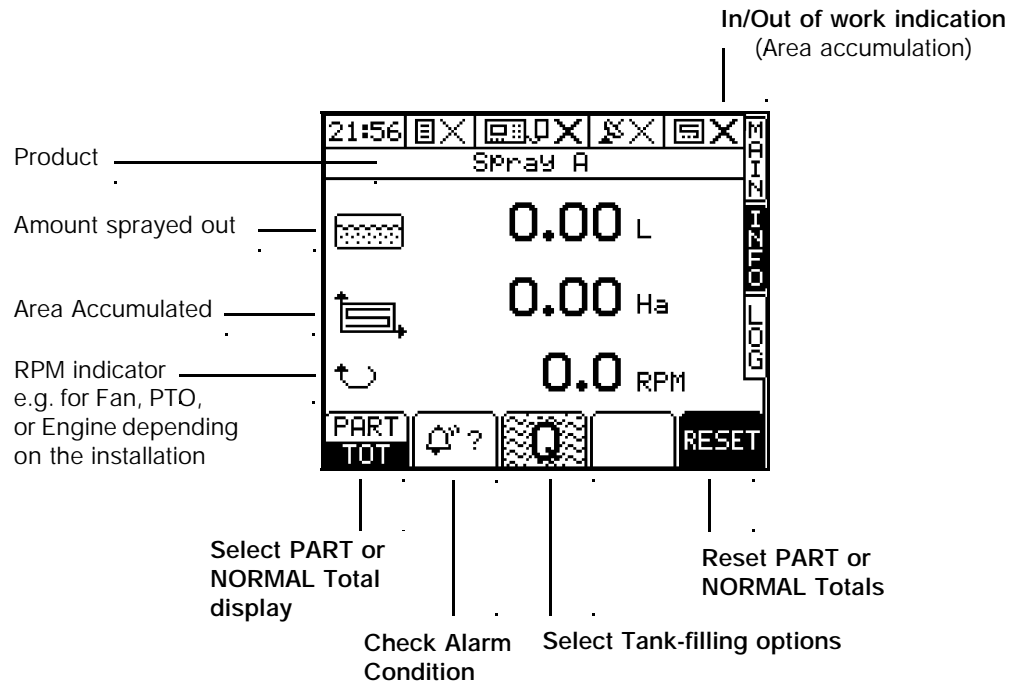


**NOTE:** The GPS icon and the Data module status icons will only appear if the GPS / Data Module settings are selected in the "PORTS SETUP" menu (refer to the calibration manual). Otherwise, the status indicators will appear on all the screen pages

### 1.4.8 The INFO screen page

Additional work measurement functions are displayed on this page. If only one tank is enabled, the screen will display only the product selected and not the tank number as shown in figure 6.

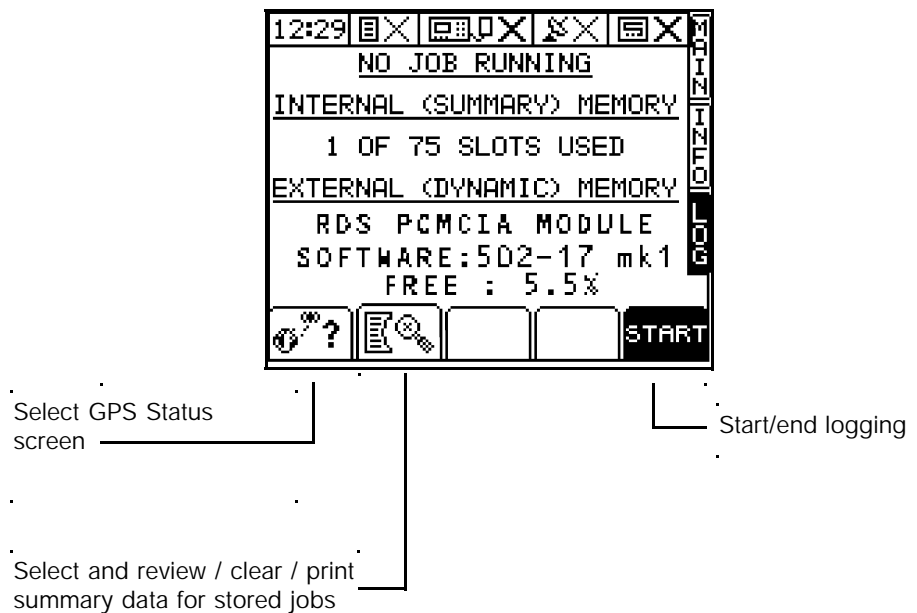
Figure 6  
The INFO screen




### 1.4.9 The LOG screen page

This page controls data logging (Field Summary data), and Precision Farming functions (when the Data Card Module is connected and enabled) and data transfer (e.g. printing a job summary).

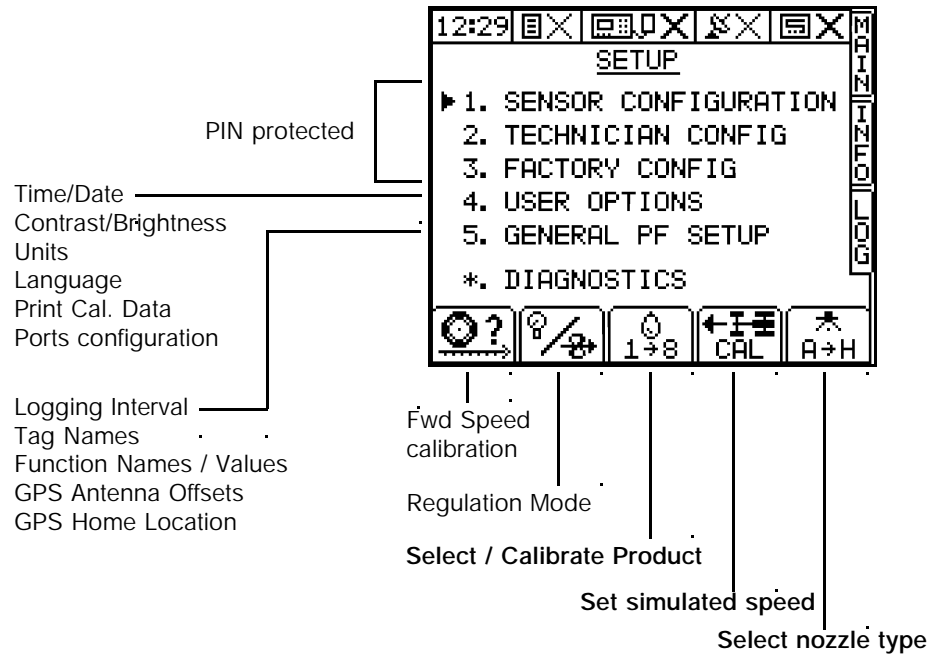
Figure 7  
The LOG screen



## 1.5 The SETUP screen page

The  key selects the SETUP menu for calibration factors and calibration settings specific to particular products being sprayed and nozzle types fitted.


**Figure 8**  
The information displayed on the SETUP screen





You should not need to enter menus 1, 2 and 3 in normal use. These settings are generally made only on initial installation. The menus can be protected with a personalised PIN number to prevent unauthorized access. Calibration settings that need to be changed during normal use are shown on figure 8.


## 1.6 Data Entry

Alpha-numeric values are entered via the right-hand keypad. You must press the key from 2 to 5 times to select the required letter. (Some keys have additional special characters not shown on the key legend).

The  key will either toggle between lower and upper case characters or when preceding a numerical entry, will set a MINUS value.

The  key will toggle between 0 and a SPACE.

The  key will BACKSPACE the screen cursor if you need to re-enter a character.

The  key is the RETURN key and is normally pressed to confirm the data entry into memory.

## 1.7 Units


Information can be displayed in Metric or Imperial units by selecting the desired option via the SETUP menu. Please refer to the Calibration manual.

The units are:-



Function	Units	
	Metric	UK Imperial
Forward Speed	km/hr	miles/hr
Application rate	litres/ha	gallons/acre
Flow rate	litres/min	gallons/min
Part/Total Area	hectares	acres
Tank volume, Part/Total volume applied	litres	gallons
Spray pressure	bar	lbs/in <sup>2</sup>

## 2 Operation

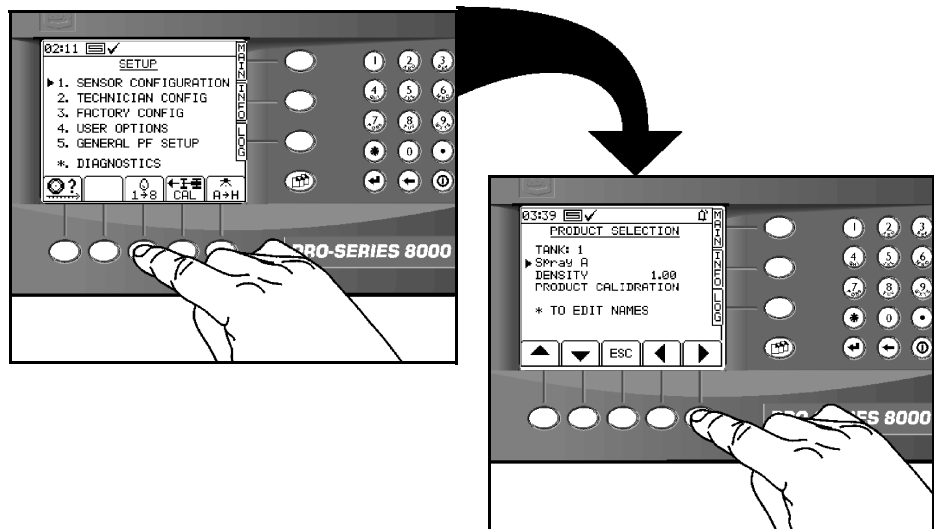
### 2.1 Startup

Press the  key. The startup screen, which shows the software version, will display for about 8 seconds then the MAIN screen is displayed.

### 2.2 Selecting the Product


- 1 Press the  key and then press the  key (figure 9a).
- 2 Using the arrow keys, move the screen cursor opposite the product, then select the product using the left/right arrow keys.

**Figure 9**  
Selecting the *PRODUCT SELECTION* screen



- 3 Press the MAIN key to return to the "MAIN" screen page.

#### 2.2.1 Editing Product Names

From the 'PRODUCT SELECTION' screen, press the  key to select the 'PRODUCT NAMES' screen.

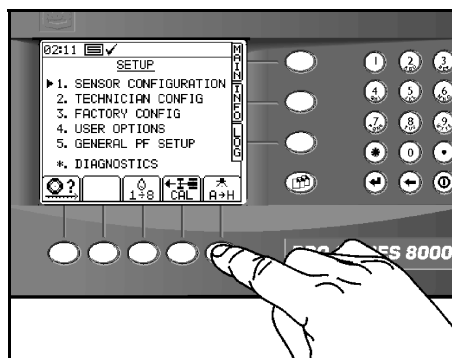
The 8 default product descriptions are 'Spray A' to 'Spray H'.

Select the product name using the arrow keys, and edit the name using the alphanumeric keypad.

## 2.3 Nozzle settings - the "Nozzle Wizard"

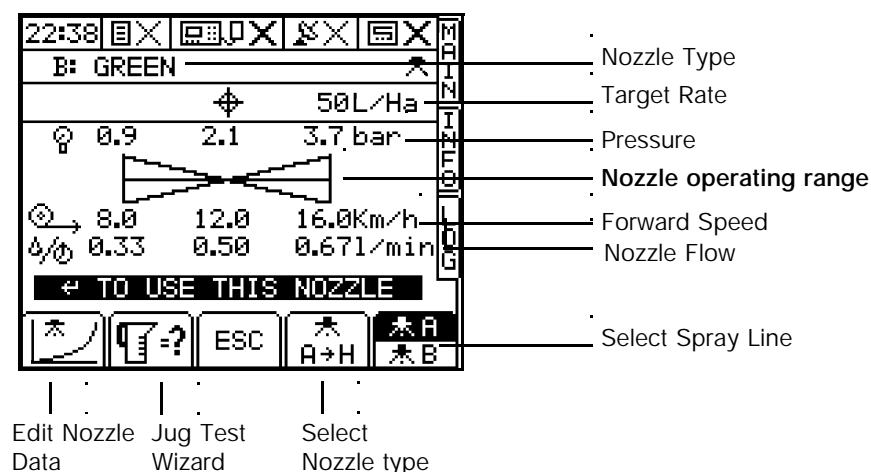
The "Nozzle Wizard" will assist you in choosing the appropriate nozzles to give satisfactory spray performance over the desired range of application rates (or forward speed).

**Figure 10**  
Selecting the "Nozzle Wizard"



The "Nozzle Wizard" displays the following;

**Figure 11**  
The "Nozzle Wizard"



The Nozzle Wizard page shows you how a selected nozzle will perform in order to achieve the Target Application Rate at a programmed Target Speed.

The centre of the "bow tie" display indicates the parameters for optimum nozzle performance (i.e. 2.1bar and 0.5 l/min at 8km/hr).. The operating range of the nozzle is based around the target speed.

There are 8 pre-programmed, ISO standard nozzle types A to H ;

Type	Colour
A	Orange
B	Green
C	Yellow
D	Blue
E	Red
F	Brown
G	Grey
H	White

### 2.3.1 Editing the preset Nozzle type







If the nozzles fitted do not correspond to any of the 8 preset types, then you must select one of the nozzle types A to H and edit the calibration data according to the nozzle manufacturers data.

Press the  key on the Nozzle Wizard to edit nozzle data.

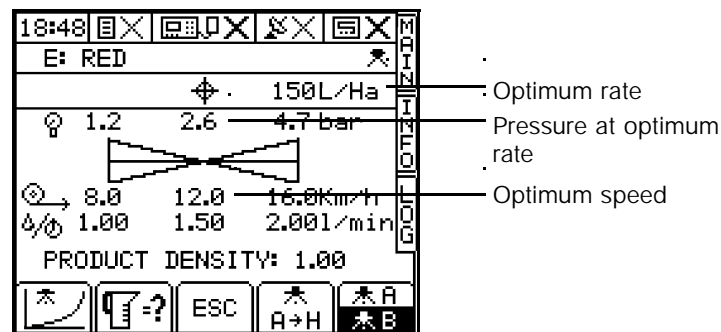
### 2.3.2 Using the Nozzle Wizard to select the correct nozzles


**NOTE:** The Nozzle Wizard is there to assist the operator in selecting suitable nozzles. The following procedure is suggested only as a general guide for nozzle selection.


Firstly, establish the lower and upper limits of forward speed and application rate at which spraying will be performed, and the optimum application rate and forward speed - i.e. the base rate and average speed. To illustrate the general procedure, let's use the example that you want to spray anywhere between 100 - 200 litre/hectare, and your forward speed will vary between 8 and 16 km/hr.

- 1 Set the target speed (say 12 km/hr). From the SETUP page, press the  key and enter the speed figure. Note that the MAIN screen will start flashing  to indicate that speed simulation is in effect. This is only relevant for the jug test and not for nozzle selection, so ignore it. Speed simulation will cease once the sprayer moves forward.
- 2 From the Nozzle Wizard page, select Spray Line B () for the larger nozzles.
- 3 Key-in the target application rate (say 150 l/ha) and press . (The target rate can also be entered directly from the MAIN screen).
- 4 Cycle through the nozzles with the  key until a nozzle is reached closest to the reference pressure (normally 3 bar) and press . In this example, the RED nozzle is suitable (fig. 12a).

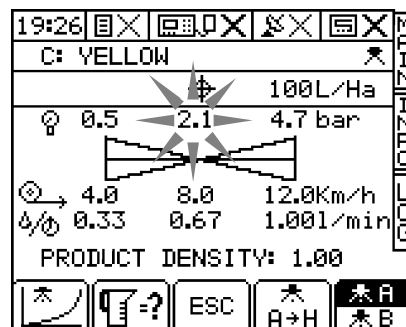
**Figure 12a**  
Select Line B Nozzles



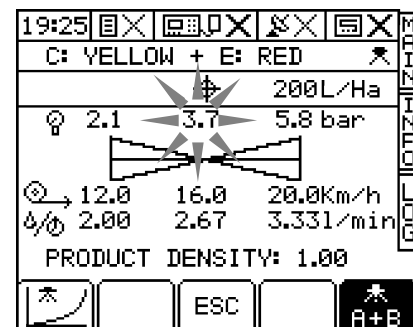
- 5 Select Spray Line A () for the smaller nozzles, and select a nozzle **two** sizes below the larger nozzle (e.g. YELLOW).
- 6 Now it's a case of checking to see that the combination of nozzles are OK over the range of application rate and speed. Select line A and set the minimum rate and speed (100 l/ha + 8km/hr). You will see that the pressure will be 2.1 bar (fig 12b), so the yellow nozzle should be OK.

Select line A+B () and set the maximum rate and speed (200 l/ha + 16km/hr). You will see that the pressure will be 3.7 bar (fig.12c), so the yellow + red combination should be OK.

**Figure 12b,**  
Checking nozzle performance at the lowest rate/speed




**Figure 12c,**  
Checking nozzle performance at the highest rate/speed







**NOTE:** The operator should finalise the choice of nozzles based on their own judgement. You are also reminded of the disclaimer regarding use of the system (paragraphs 1 to 4 on page 2 of the manual).

### 2.3.3 Programming the Product Density

You must programme the correct density when spraying fertilisers. The system will then automatically compensate in order to maintain the correct application rate and spray performance.

Whenever the programmed density for the selected product is anything other than 1.00 the instrument will display the  icon on the main screen.

- 1 Press  to select the "SETUP" screen.
- 2 Press  to select the "PRODUCT SELECTION" screen (fig 9).
- 3 Select the "DENSITY" line, key-in the correct density and then press .
- 4 Use the "ESC" key or press  to return to the "SETUP" screen, (or press the MAIN key to return to the operation screen).

### 2.3.4 Nozzle Calibration

Refer to section 3 of the calibration manual.

## 2.4 Automatic Rate Control



Select 'AUTO' from the 'MAIN' screen. The flow rate will be automatically adjusted as forward speed varies, to ensure that the application rate constantly matches the preset target rate.

### 2.4.1 Setting the Target Application Rate

From the "MAIN" screen simply key-in the desired target rate and press

### 2.4.2 Overriding the Target Application Rate

Press to override the target rate.

The preset target rate can be overridden in  $\pm 5\%$  steps while spraying, e.g. over localised weed infestation or other crop conditions.

While overridden, the target rate indicator 100 will flash.

Press to return to the target rate.

**NOTE :** *The instrument will automatically alarm if the flow rate/forward speed goes above or below the limits programmed via the 'SETUP' menu.*

When the alarm threshold is reached first of all the screen will change to show the alarm screen and the message "FLOW LOW" or "FLOW HIGH" is displayed. The instrument will beep continuously. Press any of the lower 'OK' keys to cancel the alarm screen and return to the 'MAIN' operating screen. An alarm bell icon in the upper right hand corner of the screen will continue to flash and the instrument will beep every 5 seconds to remind you of the alarm condition.

**NOTE:** *If the instrument flashes the alarm bell icon as above, at any time you can re-identify the cause of the alarm by pressing the key on the INFO screen.*

## 2.5 Manual Rate Control

You do not normally need to select this mode, however in the event you experience a problem with automatic control (if for example the forward speed sensor had stopped working), you can still control the application rate manually.

Select 'MAN' from the 'MAIN' screen. To maintain the required application rate, you must maintain a constant forward speed. You can also log and store field data ("job summaries") as you go, and print them out or download them to a PC or printer when convenient.


Press to adjust the application rate.

**NOTE :** *The speed range indicator functions as normal, however there is no forward speed or flow rate alarm in manual mode.*

## 2.6 Tank Contents

The *Apollo 8000* automatically calculates the volume of liquid remaining in the appropriate tank. The calculation is based on the full tank volume which is programmed via the "INFO" screen. You can also programme an alarm threshold so that the instrument will warn you when the tank volume is getting low.


When the alarm threshold is reached (e.g. 200 litres), first of all the screen will change to show the alarm screen and the message 'TANK # LOW'. The instrument will beep continuously. Press any of the lower 'OK' keys to cancel the alarm screen and return to the 'MAIN' operating screen. An alarm bell icon in the upper right hand corner of the screen will continue to flash and the instrument will beep every 5 seconds to remind you of the alarm condition.

**NOTE:** *If the instrument flashes the alarm bell icon as above, at any time you can re-identify the cause of the alarm by pressing the  key on the INFO screen.*

The screen will change to show the alarm screen and the message 'TANK # EMPTY' once the tank contents register reaches zero. Again, press any of the lower 'OK' keys to cancel the alarm screen to return to the 'MAIN' operating screen, and the alarm will continue as above.

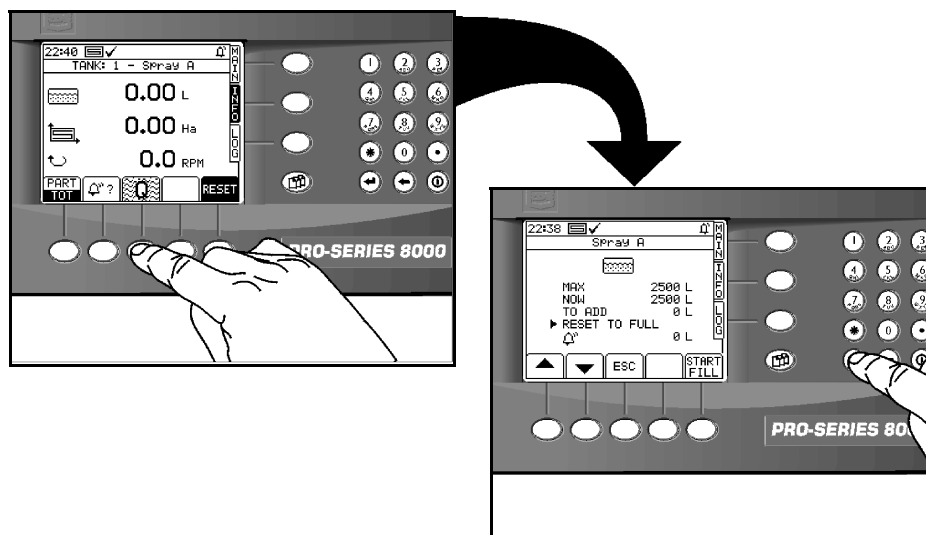
The tank contents register must be reset manually after re-filling the tank unless your system includes the optional *Tank Inflow Sensor and Flow Shutoff Valve*. When fitted this enables the instrument to automatically monitor re-filling and cut off the inflow when the tank is full.

### 2.6.1 Tank filling (Manual)

- 1 INFO" screen and press  to access the TANK FILL screen (fig. 14). The screen will display,



"MAX" - the full tank volume  
 "NOW" - the volume remaining in the tank  
 "TO ADD" - volume to replenish

Figure 14  
 Resetting the Tank Volume




- 2 Fill the tank to the desired level.
- 3 Confirm that "MAX" corresponds to the quantity in the tank. Adjust as necessary.


**NOTE:** *Move the screen cursor using the arrow keys and enter values via the numeric keypad.*

- 4 Press  to reset to the full tank volume.
- 5 Confirm the alarm volume (  ) is OK (typically the volume needed to spray a single bout). Adjust as necessary.

### 2.6.2 Tank filling (Automatic)

A Tank Inflow Sensor must be installed to measure the inflow. A Shutoff Valve must be installed to stop the filling automatically.

- 1 Connect the inflow hose.
- 2 Select the "TANK FILL" screen as above.
- 3 Confirm that "MAX" corresponds to the quantity you want in the tank after filling. Adjust as necessary.
- 4 Confirm that the "NOW" volume is the volume currently in the tank. Adjust as necessary.
- 5 Confirm the alarm volume as above.
- 6 Press the  key.

The "TO ADD" volume will then count down and the screen will display "STOP INFILL". If a Shutoff Valve is fitted, filling will cease automatically when the "TO ADD" volume reaches zero. You can also press  at any time to stop filling. An audible alarm will sound and filling will stop.

## 2.7 Part / Total Accumulation and RPM display

You can record the area and volume sprayed for a particular job using the "PART" Total function. In addition the area and volume will be recorded to the "TOTAL" memory register.

- 1 Select the "INFO" screen to display the accumulated totals and the RPM display.




- 2 Select 'PART' to display the Part Area and Part Volume accumulation, or..



"TOTAL" to display the Total Area and Total Volume accumulation.

### 2.7.1 Reset Totals

- 1 Select the "PART" or "TOTAL" display.
- 2 Press the **RESET** key.
- 3 Press  to zero the totals or press **ESC** to return to the "INFO" screen.

## 2.8 Forward Speed and Flow Rate Alarm

You can preset upper and lower thresholds for forward speed and flow rate based on data from the manufacturers nozzle charts of the acceptable flow/pressure operating range. Also the system can regulate correctly only within a certain range depending on the size of the control valve and flow sensor fitted.

If these limits are exceeded then the instrument will automatically alarm. First of all the screen will change to show the alarm screen and the message 'FLOW LOW 1' or 'FLOW HIGH 1' (where the number is the instrument channel number). The instrument will beep continuously.

'FLOW HIGH' may be caused by the control valve being unable to dump sufficient flow back to the sprayer tank as a result of:- speed too slow or stationary, too small or too few nozzles in use - sections off or blocked nozzles, pump capacity too large or control valve too small.

'FLOW LOW' may be caused by:- forward speed too high, insufficient pump capacity, low pump speed, low or empty tank, blocked filters or incorrect jets.

Press any of the lower 'OK' keys to cancel the alarm screen and return to the 'MAIN' operating screen. An alarm bell icon in the upper right hand corner of the screen will continue to flash and the instrument will beep every 5 seconds to remind you of the alarm condition, until the forward speed and/or flow rate return within the preset limits.


### 2.8.1 Spray performance Indicator

The Spray performance Indicator shows the nozzle performance within the minimum and maximum parameters displayed on the Nozzle Wizard page. The "Target Speed" is at the middle of the speed range.

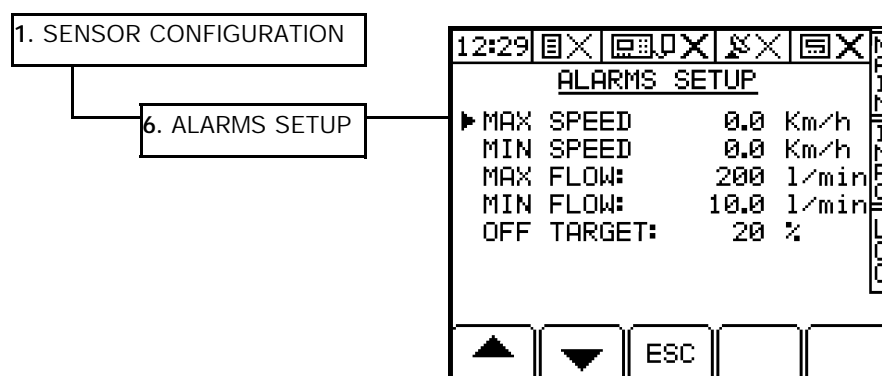


For optimum nozzle performance and spray pattern you should maintain your forward speed as close to the "target" speed as possible.

### 2.8.2 Setting the Alarm thresholds

- 1 Press  to select the "SETUP" menu.
- 2 Select the "ALARMS SETUP" screen (fig.15).

**Figure 15**  
Selecting the ALARMS  
SETUP screen



- 3 Select the appropriate alarm threshold using the arrow keys and enter the value via the numeric keypad.




## 3.2 Variable Rate Treatment (VRT)

An RDS Data Card Module and a GPS receiver must be connected.

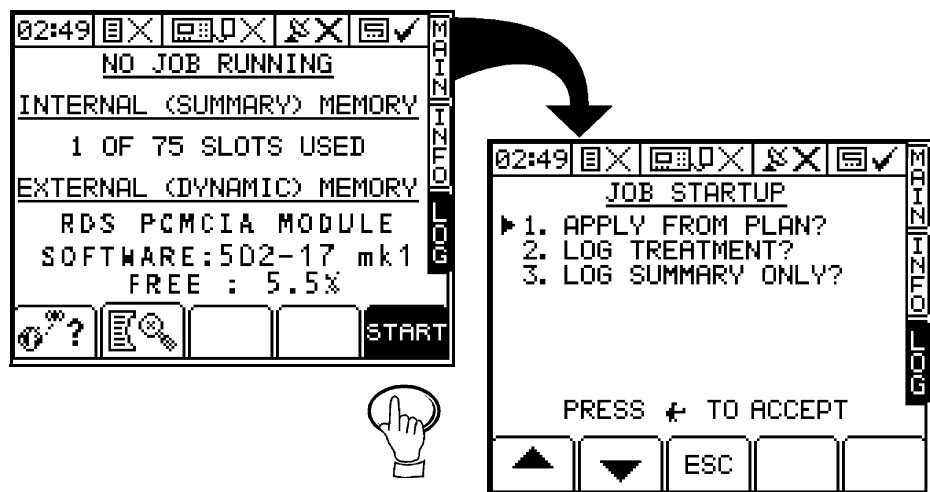
### 3.2.1 Running a Variable Rate Treatment plan



- 1 Press the LOG key.

The screen will display the current logging status, the number of jobs (job summaries) stored in memory, and the status of the PCMCIA card if found (fig. 17). If the module is not detected the message "NO MODULE FOUND" is displayed. When successfully connected, the  icon appears at the top of the screen.

- 2 Press the START key. The JOB STARTUP page is displayed.

**Figure 17**  
Select the JOB STARTUP page



- 3 Select the logging option "APPLY FROM PLAN".
- 4 If known, key in the FARM NUMBER and FIELD NUMBER of the treatment plan. If not, then press the LIST key, and the display will list all the farm / fields for which there are plan files on the datacard. Simply select the appropriate farm / field description in turn from the lists.
- 5 SELECT THE APPROPRIATE PLAN and press .
- 6 Press the START key. The "EXTENDED DATA FUNCTIONS" page is displayed. If you don't wish to programme any extended functions, then press .

**NOTE:** If you want to programme extended functions, refer to section 3.2.5.

Wait while the work plan file is loaded and a work record file is created on the Data Module. Once the plan is loaded, the "RUNNING A PLANNED JOB" page appears, and displays the tag list (fig. 18). See section 3.2.4 about tagging.

Figure 18  
Running a Treatment Plan




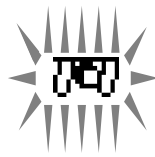
While VRT mode is in operation a flashing satellite symbol (fig. 19) is displayed alongside the Target Rate on the MAIN screen. The  icon appears animated at the top of the screen while logging is in progress.


Figure 19  
Indication that variable-rate treatment is in progress



The target rate on the MAIN screen now becomes the application rate according to the treatment plan data (Base rate x Multiplier) and the position in the field. The treatment rectangle size is defined in PLOT/PLAN.




**Plan Status Display**

Press the  key to display the current application rate according to the treatment plan, for each distribution system in operation. This is displayed as "Base Rate x Multiplier = App. Rate"

**Application Rate without a GPS Signal**

If you lose the DGPS signal the treatment rate will revert to the "Base Rate" specified in the plan.



**Application Rate Outside the Field Boundary**


If you go outside the field boundary but are still within the treatment rectangle, a  icon flashes on the display and the instrument beeps continuously. The application rate reverts to the base rate.

If you are outside the field boundary and treatment rectangle, then the application rate goes to zero.

**3.2.2 Overriding the VRT application rate**



You can vary the actual application rate at any time using the   keys.

The target rate display will flash until you press  to return to the target rate.

**3.2.3 Stop a VRT job**

To stop running a job, simply press the "STOP" key on the LOG screen. The job summary is appended to the work record file on the data module, and saved to the internal memory.

### 3.2.4 Tagging

During application, you can log the presence of up to eight different features in the field, e.g. different weed infestations, pest damage etc. To switch a tag on or off, simply press the appropriate number key.

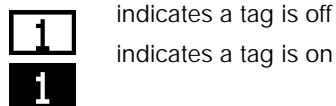


Figure 20  
Setting Tags



Tags 1 to 4 are preset for Blackgrass, Wild Oats, Cleavers and Thistles. You can however, edit the tag names from the "GENERAL PF SETUP" menu.


### 3.2.5 Extended Data Functions


Dynamic log files and simple job summaries can include up to 12 additional data. All 12 data items can be user-defined to suit individual requirements e.g. Operator name, Wind Speed, Air Temperature, Growth Stage, Product etc.


Entering extended data is optional.

Figure 21  
Setting Extended Functions



The functions are "F1" to "F12" by default. You can re-programme the default function names and function values from the "GENERAL PF SETUP" menu (please refer to the calibration manual). If you do not want to change the default, simply press  to accept it, and then the next "F" function appears (fig. 21).

Enter the data (up to 20 alpha-numeric characters) via the alpha-numeric keypad. The existing data will be over-typed. Press  to confirm the data entry.

You can repeat the data entry procedure for up to 12 'F' functions, however, if you do not need to programme any of them, simply press  at any time to start logging.

### 3.2.6 Display vehicle track - "MAP"

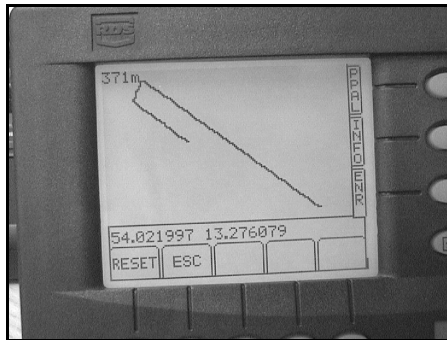
From the LOG screen (fig. 20), press the "MAP" key.

The screen displays the real time position of the vehicle (the "+" cursor), and the vehicle track for the last 100 logged data points.

The screen also displays the latitude and longitude in decimal degrees, and the number of points. As the vehicle proceeds from the start of the job, the screen plots and automatically zooms out to display up to a maximum of 100 logged data points. Beyond this, as the job progresses, the display pans in the direction of movement to keep the previous 100 data points on screen.

Press the 'RESET' key to start the plot again from the current position.

Figure 22  
Displaying the vehicle track



If you selected the "LOG TREATMENT" option from the LOG screen page, the track data is saved to a dynamic logging file on the data module, which can then be viewed in PLOT/PLAN.

### 3.2.7 Display GPS Status


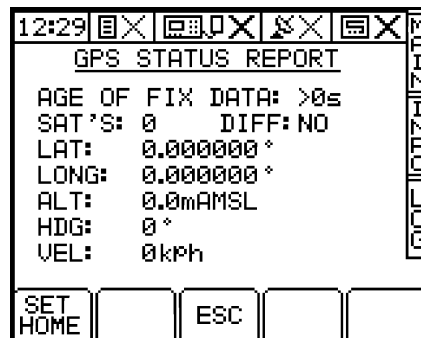
From either the LOG page, "RUNNING TREATMENT PLAN" page or "RECORDING A DYNAMIC JOB" page, press the  key to view the current GPS status.

Figure 23  
GPS Status



Age of Fix Data (when reception is good, the time should not be more than 1 second); Number of Satellites (minimum of 4 for full differential fix); Differential Status; Latitude and Longitude (in decimal degrees); Altitude; Heading and Velocity.

All this data is read directly from the NMEA GGA and VTG messages. You can also set the "Home Position" from this screen (for a full explanation of "Home Position", please refer to the calibration manual).


### 3.3 Dynamic Data Logging

When spraying conventionally (i.e. not VRT mode), you have an option to generate a full spray application record, logging rate and other parameters (e.g. "tags") in real time, attributing this data to a specific location. The associated "Dynamic Logging" file is saved onto the Data Card Module and can subsequently be viewed in PLOT/PLAN.

An RDS Data Card Module and a GPS receiver must be connected.


#### 3.3.1 Start recording a Dynamic Job

- 1 Press the LOG key.

The screen will display the current logging status, the number of jobs (job summaries) stored in memory, and the status of the PCMCIA card if found (fig. 17). If the module is not detected the message "NO MODULE FOUND" is displayed. When successfully connected, the  icon appears at the top of the screen.

- 2 Press the START key. The JOB STARTUP page is displayed (fig. 17)

- 3 Select the logging option "LOG TREATMENT".

- 4 When prompted, enter the FARM NUMBER and FIELD NUMBER reference. The "EXTENDED DATA FUNCTIONS" page is then displayed. If you don't wish to programme any extended functions. then press .

- 5 If you want to programme extended functions, refer to section 3.2.5.

The screen will display "NEGOTIATING FILE STORAGE - JOB NUMBER #" as it creates the dynamic log file on the data module. Once the plan is loaded, the "RECORDING A DYNAMIC JOB" page appears, and displays the tag list (fig. 24).

Figure 24  
Dynamic Logging



While dynamic logging is in progress, the  icon appears animated at the top of the screen.

- 6 You can at any time apply the Tag functions to log features in the field. Please refer to section 3.2.4 overleaf.


#### 3.3.2 Stop recording a Dynamic Job

To stop running a job, simply press the "STOP" key on the LOG screen. The job summary is appended to the dynamic log file on the data module, and saved to the internal memory.

### 3.4 Field Data Logging

For farm record keeping and traceability purposes, you can record a summary of each job or work session in the internal memory, and subsequently download directly to a PC, or print to an RDS ICP200 In-Cab Printer. You can store up to 75 job summaries.

#### 3.4.1 Start recording Field Data

- 1 Press the LOG key.  
The screen will display the current logging status, the number of jobs (job summaries) stored in memory, and the status of the PCMCIA card if found (fig. 10a).
- 2 Press the START key. The JOB STARTUP page is displayed (fig.17)
- 3 Select the logging option "LOG SUMMARY ONLY".
- 4 When prompted, enter the FARM NUMBER and FIELD NUMBER reference. The "EXTENDED DATA FUNCTIONS" page is then displayed. If you don't wish to programme any extended functions, then press  .
- 5 If you want to programme extended functions, refer to section 3.2.5.


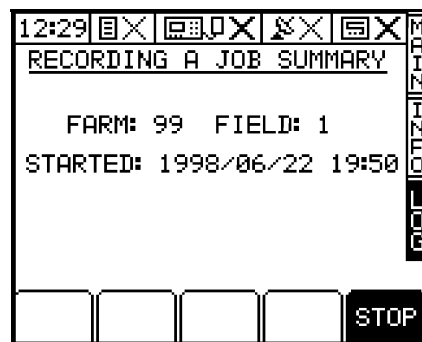
The "RECORDING A JOB SUMMARY" page appears (fig. 25). While field data logging is in progress, the  icon appears animated at the top of the screen.

Figure 25  
Field Data Logging



#### 3.4.2 Stop recording Field Data

To stop running a job, simply press the "STOP" key on the LOG screen. The job summary is saved to the internal memory.

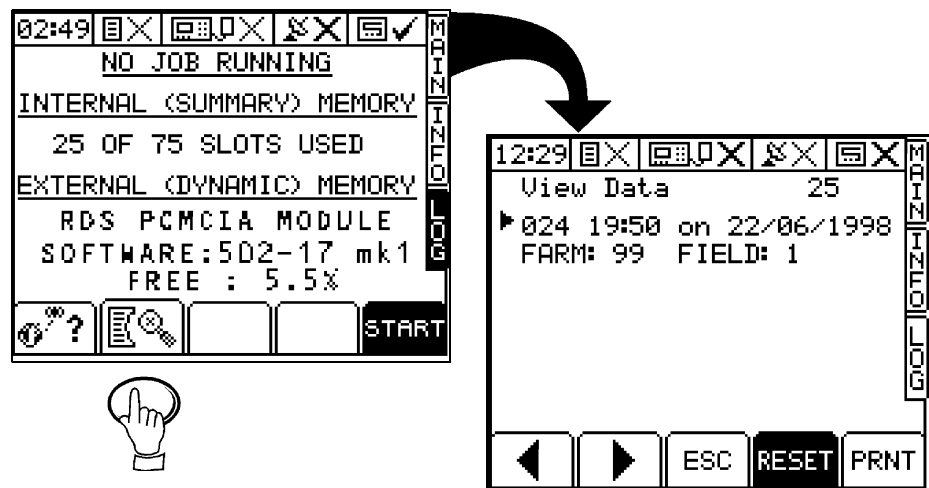
### 3.5 Review, Reset or Download a Job Summary

You can view, delete, print or download the job summaries. The summary prints out as a job ticket and includes space for comments and signature. It includes all the basic data listed in section 3.5.2 along with any extended data that was programmed, for each tank that is enabled.

#### 3.5.1 Review / Reset Job Summaries

- 1 Press the  key from the LOG page.

Figure 26  
Review / Reset Job  
Summaries



- 2 Scroll through the individual summaries using the arrow keys.
- 3 Press the **RESET** key to delete the selected summary.

#### 3.5.2 Summary Data Formats

You can download the data to;

*Data Card Module* - Each summary is saved as a text file e.g. "JOB0001.TXT", and is formatted the same as a printed job ticket.

*ICP 100 or ICP 200 In-Cab Printer* - prints in .TXT format as a job ticket with space for written comments and a signature.

*Directly onto a PC* - via the "Pro-Series PC Upload Lead" ref: RDS Pt. No. S/CB/268-1-032. Data can be output in .CSV format for import into a spreadsheet or database.

The top port should be configured as follows;

Data Card Module - "RDS PF MODULE"

ICP 100 In-Cab Printer - "RDS PRINTER TYPE I"

ICP 200 In-Cab Printer - "RDS PRINTER TYPE II"

Directly onto a PC - "PC DOWNLOAD"

Job summaries from the Sprayer Controller contains the following data;

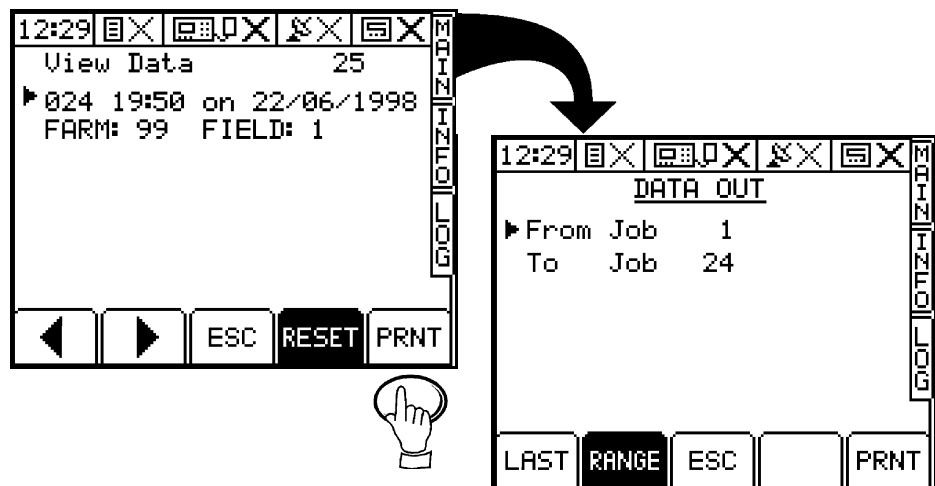
- Job Number
- Start Date
- Start Time
- End Time
- Job Duration
- Channel No.
- Machine ID / Name
- Farm No.
- Field No.
- Product / Crop
- Cal Factor
- Area
- Work Rate
- Quantity spread
- Quantity loaded
- Average Application Rate
- Extended Functions F1 to F12 values
- Comments\*
- Operator\*
- Transmit Time and Date

\* Not included in .CSV format

### 3.5.3 Select and Print / Download Job Summaries

- 1 From the "View Data" page (fig. 26, 27), press the **PRNT** key.

Figure 27  
Download Job Summaries



- 2 Press **LAST** to select the last summary recorded or press **RANGE** to select a number of individual summaries.
- 3 If downloading a range of job summaries, simply type the job numbers on the "DATA OUT" page, then press **PRNT**.
- 4 Select the printout style:- TEXT MODE for ASCII text output or CSV MODE for import into an Excel spreadsheet.

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