5400 Professional Installation

User's Guide

Contents

1.0 GUIDANCE SYSTEM

1.1 INTRODUCTION

You have made an excellent choice in purchasing the **Farmlap professional 5400** Guidance System.

Farmscan has spent years developing and acquiring high quality DGPS based systems for agriculture. FARMLAP is one of these systems.

With Farmlap you can:

1. **Reduce input costs.** Farmlap enables you to reduce overlap and misses in any driving situation. As you well know, chemical over spray is not only an unwanted cost but can affect crop yields.

2. **Increase the time you can spend working, not waiting.** Timing is a major management issue for any size operation and your Farmlap system helps address this. Visual guidance enables you to operate under conditions that conventional marking systems cannot. Night, poor visibility, in crop, anytime weather conditions permit.

3. With additional hardware your Farmlap system can be used for Variable Rate control for both Seeding and Spraying, **Auto Steer** and **Boom Switching.**

All of this is made possible by the use of GPS (Global Positioning System) along with a Differential signal (DGPS - Differential GPS) and a computer system designed to withstand rugged operating conditions. Another necessary part of the system is the software that comes installed on the computer to analyse and manage the data being captured.

The DGPS is necessary to obtain an accurate position - unlike standard GPS, which can be inaccurate by more than 10 metres. The GPS signals are transmitted to your system from the GPS satellite network. The correction signal (differential) is sent from a base station or from a geostationary commercial satellite.

This guide is presented in sections consisting of the hardware (computer, cabling, DGPS receiver, antenna etc) followed by detailed considerations of the software programs that are used by the computer to record and analyse the information.

This manual has been designed to get you up and running quickly. It outlines both installation and operation procedures.

Farmscan is proud to provide you with such a product and trust you will enjoy many years of efficient use from your FARMLAP GUIDANCE SYSTEM.

Farmscan reserves the right to change this guide and the specifications of the Guidance System without notice. System components may vary from those described in this guide.

2.0 COMPONENTS

2.1 TYPICAL CORE COMPONENTS

- A-5400 Guidance PC
- A-5002 (Conventional) or A-5002H (Hardi) USB 10 Button Box Controller
- A-5006 3 Way power adaptor
- 3011 OmniSTAR DGPS Receiver

2.2 TYPICAL INSTALLATION COMPONENTS

- AH-5400 Guidance system mounting bracket
- AC-204 1x 5m vehicle power lead for permanent installation
- AC-503 1x 1m power leads with Packard Plug for temporary installation
- AH-5400 Farmlap Installation Kit contains:

*	U-030	1/2 m Dual Lock
*	P-031	2x Crimp Connectors - Yellow
*	P-025	2x Ring Terminals - Yellow
*	S-528	1x Blade Fuse Holder
*	S-545	1x Blade Fuse - 30 AMP
*	HG-704	50x Cable Ties

2.3 OPTIONAL COMPONENTS

- PC-508 USB 64 – 256mb Thumbdrive
- 7102 External Light bar
- PC-504 USB Link Cable (for connecting to home computer)

(Their are many Farmlap Peripherals available, Please contact your local Premium Dealer for a list)

3.0 INSTALLATION

3.1 PROFESSIONAL INSTALLATION & TRAINING

Please contact your local dealer if you wish to have a professional installation carried out.

This manual offers comprehensive instructions on D.I.Y installation, if this service is not available to you, or you choose to install the system yourself.

3.2 SELF INSTALLATION- IMPORTANT POINTS

- Please read the entire section on installation before starting.
- The Guidance System consists of five main components. These being the DGPS antenna, the DGPS receiver, the Button Box, the computer, and the mounting kit.
- The Guidance System is designed to be easily transferred between vehicles.
- The computer comes equipped with Farmlap, Skymapper and other software as requested pre-installed. All programs supplied by Farmscan must be registered before use. Please contact your local dealer.

4.0 3011 DGPS – 132

4.1 Typical DGPS Hardware

- Omnistar OmniLite 132 DGPS receiver.
- Power lead
- Combined GPS/Differential antenna, cable & Magnetic Mount
- Serial data cable for connection to computer
- Galvanised steel plate.

Your OmniSTAR Receiver is pre configured to suit the mode required by Guidance and Mapping. All you need do is connect the appropriate cables and power up the system.

1. Remove the receiver from the box.
2. Find a safe, easy to access position that is out of direct sunlight in your vehicle for installation.
3. Use a Dual Lock strip (an 8 cm length should be plenty) to attach the receiver to the cab.
4. Attach the antenna cable into the antenna socket.
5. Attach the power cable into the large central socket.
6. Attach the computer cable into Port A.
7. Detailed specifications can be found in the OmniSTAR operators Manual.

5.0 DGPS REGISTRATION

Your DGPS has been supplied with a limited amount of signal on a count down timer. This will enable you to test the system before you commence your 12 month subscription.

In order to register your DGPS you will need to follow these steps:

1. Call Farmscan on **(08) 9470 1177.**
2. Identify yourself as a Farmlap owner wanting to resubscribe your DGPS.
3. For the Omnistar DGPS ensure you have your DGPS outside in the open, powered up and running.
4. Have the serial number (FOE411XXX code) of your DGPS with you when you call.
5. Make sure the system is paid for, otherwise registrations will not occur (unless special arrangements have been made).

6.0 DGPS ANTENNA

The DGPS Antenna comes equipped with a strong magnetic base that assists installation and transference between vehicles.

- If you are using a vehicle with a fibreglass or plastic cab you will need to attach a metal plate to your vehicle. The Guidance System comes equipped with a galvanised metal plate.

- **Position the DGPS antenna on the cab towards the rear in a central line with the implement. It is important that obstacles in the horizontal plane, including whip antennas do not obstruct the DGPS antenna, as this affects performance. Keep at least 60cm away from other antennas. If an orange warning light is fitted the base of the antenna must be level with the top of the light.**

- The antenna cable plugs straight into the back of the DGPS Receiver.

!! Do not kink or crush the antenna cable, as antenna performance will be affected!!

7.0 RECOMMENDED COMPONENT POSITIONS

Before beginning to install your system it is important that you establish where the parts will be situated in the cab.

7.1 Computer

The computer needs to be mounted in an easily viewable location with in reaching distance. Most farmers choose to mount the display in a central location in front of or to the left of the steering wheel, however there is no real necessity to do this.

It is important that you develop a feel for the system and that it fits into your operating procedures. Locate the display in a position you find most comfortable.

7.2 Button Box

The button box is your main operating tool. One hand should be on or near the button box throughout your operating activities. Consider the button box as an extension of your machine controls and locate it appropriately for convenience.

7.3 The Mounting Kit

Before permanently installing any components into your vehicle you should first examine the cab to ensure that you know where all the pieces will fit in relation to each other and how they will affect your operating procedures.

- The most important part of the installation process is ensuring you are comfortable while operating and not hindered in any way by the location of components.

- The whole system is designed to be easily transferred between vehicles.

8.0 INSTALLATION HINTS

- The Dual Lock is a very strong system for attaching components to your vehicle. Do not overuse, as it will make it difficult to remove items.

- There are only a small amount of items that require Dual Lock but there may be a lot of vehicles you wish to attach the items to.

- Storage - When not in use we recommend storage in a cool, dry, dust-free environment. This will ensure that your Guidance System stays in good working order.

- Avoid running antenna, power, or data leads alongside cables from any other device. This is a good rule for any electronic equipment in the cab as it helps prevent RF interference between devices.

- It is very important that antennas for two-ways or mobile phones be kept well away from the DGPS antenna (and each other) to avoid possible RF interference.

!! Note: - It is essential that the DGPS antenna have an unrestricted 360-degree view around the vehicle. Frames, brackets, lights etc must not be higher than the base of the antenna in the horizontal plane. If there are any obstructions GPS satellites can be blocked which will degrade performance and if the satellite that delivers the differential signal is blocked, performance will be seriously degraded or become unusable.

9.0 GUIDANCE COMPUTER

- Find a suitable position in the cab for the guidance computer. Make sure the mounting is rigid and the screen is viewable.
- Make sure that the cables that need to be attached to the guidance computer reach.
- Make sure the mounting does not interfere with the operation of the machine. i.e. not interfering with the brakes or steering.
- Make sure that the guidance computer is attached to the "Smart Docking" station correctly. Check that thumbscrews are tight.

10.0 BUTTON BOX - 10 Button

The Button Box is a simple tool that allows you to perform some common operations of Farmlap without using the computers touch screen.

10.1

The Button Box should be installed in a convenient location within easy reach of your hand.

10.2

Use some of the Dual Lock supplied to attach the Button Box to the cab. You will need about a 7cm strip.

There are five terminals on the Farmscan Button Box, these allow for a connection with other devices that switch a voltage (plus 3 volts) to Start/Stop Farmlap's operation.

The function of each terminal is as follows:

5 - Common Ground- Can be chassis earth or linked to a common earth on the controller.

4 - Hardi Master Off- Wired into the (-) 12v on the motor valve. Generally corresponds to the Green/Yellow wire on the Hardi Pilot.

3 - Hardi Master On- Wired into the (+) 12v on the motor valve. Generally corresponds to the No. 11 wire on the Hardi Pilot.

2 – Conventional-Master On Requires (+) Positive voltage above 3v.

1 - (+) 12v- NOT CURRENTLY USED WITH FARMLAP.

Wiring Instructions

Conventional -

- Run a wire from the positive side of your master switch to pin 2 on the phoenix plug provided with the button box.

- Run a wire from pin 5 to a common ground.

Hardi - Requires three wires -

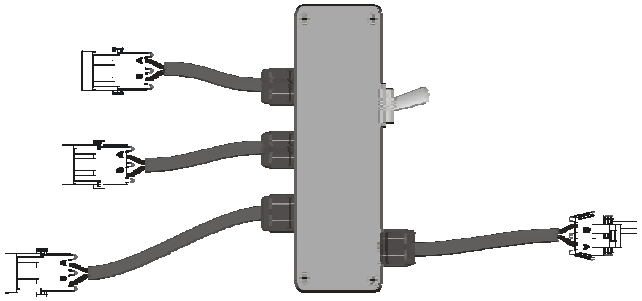
- A wire needs to be run from pin 5 to a common ground.

- To pick up master on/off you need to run a wire from the Hardi Pilot, generally located on the boom. Run a wire from pin 19 on the circuit board in the pilot (wire 11 is plugged into this pin) to pin 3. This is master on.

- Run a wire from pin 18 on the circuit board (green yellow wire is plugged into this pin) to pin 4 on the phoenix plug.

It is recommended some sort of breakaway be installed at the drawbar.

11.0 3 WAY POWER ADAPTOR



Power is required for:

1. The DGPS Unit
2. Smart Dock Bracket
3. Boom Bits NG Box (optional)

- The power adaptor consists of 3 12-Volt Packard plug. The power adaptor plugs into a cable connected directly to a 12V Battery, or for a temporary installation, straight into your vehicles cigarette lighter socket. (A = 12 volt, B = Earth)
- The adapter should be located in an area that doesn't affect operational activities but is still accessible as the units main power switch.
- Attach the adapter to the vehicles cab by using 2 small strips of Dual Lock.
- Attach one end of the 5metre power lead supplied directly to the vehicle battery using the supplied 30 amp fuse and eye terminals. Solder the joints for a good connection. Attach the plug at the other end to the corresponding plug on the 3 Way power adapter.
- Do not use the power wire to supply power to any other device.
- Ensure that wires you run are secure and will not rub on sharp edges and short out.
- Plug the computer and the DGPS power plugs into the 3 Way power Adapter.

12.0 INTERFACE SETUP

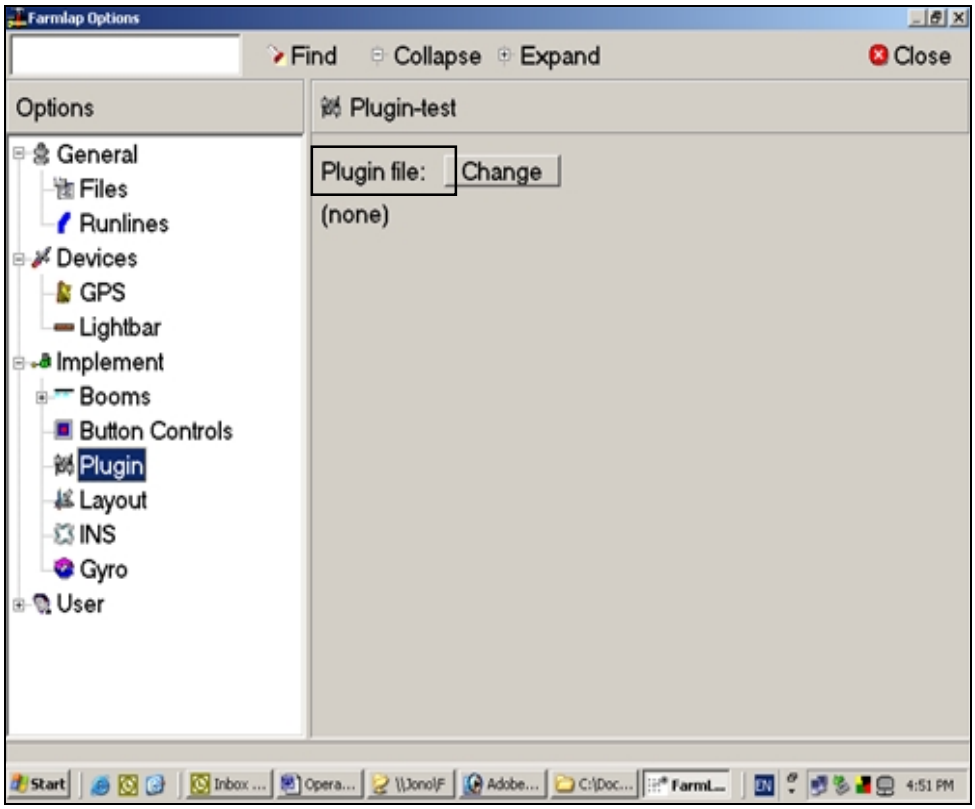
(Interface Setup Options)

The Farmlap system can be serially interfaced to one of the following units:

2400 / 24V1 / RAVEN / TRANSPREAD / COMSPREAD / HARDI / BOOM SWITCH

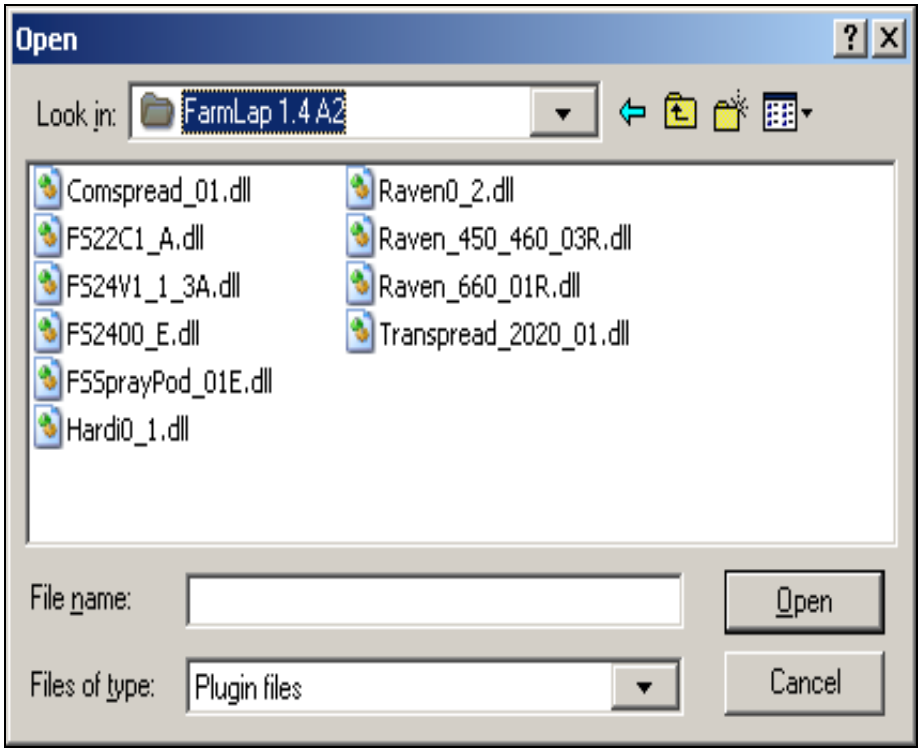
If you have the suitable hardware for one of the above interfaces the following steps must be taken to activate it.

STEP 1. On the Menu bar **Select View | Options | Expand | Plugin** in the left window.



STEP 2. On the right window Click Change.

You will be presented with the following dialog box.



Choose the relevant file.

If you have:		**You Need to Use:**
Farmscan 2400 Select:		Farmscan0_2.dll or FS2400_E.dll (Preferred)
Farmscan 24V1	:	FS24V1_1_3A.dll
Farmscan 22CX	:	FS22C1_A.dll
Hardi	:	Hardi0_1.dll
Raven 440	:	Raven0_2.dll
Raven 450/460	:	Raven_450_460_03R.dll
Raven 660/661	:	Raven_660_01R.dll
Transpread	:	Transpread_2020_01.dll
Comspread	:	Comspread0_1.dll

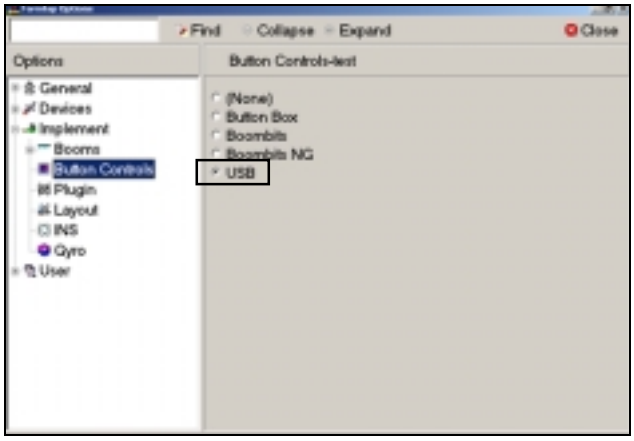
After selecting the correct DLL file for your interface click **OPEN**

You will see the path to the DLL appear under the Change button.

13.0 SPRAYER SETUP USING PLUGIN

To enable your selected interface the following settings need to be activated.

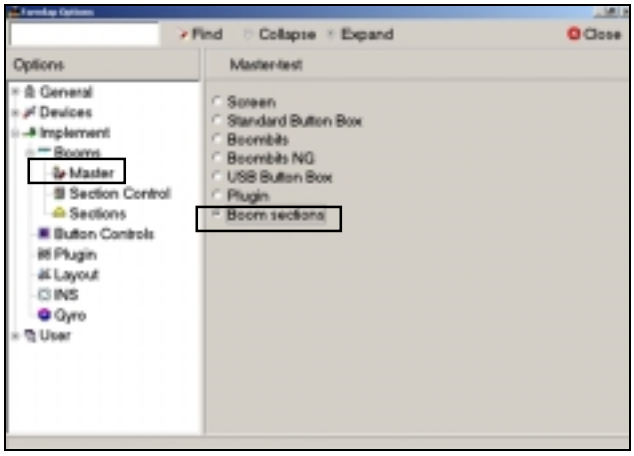
Go to VIEW | **OPTIONS - EXPAND**



1. Button Controls

!! Your Button Control will always be **USB!!**

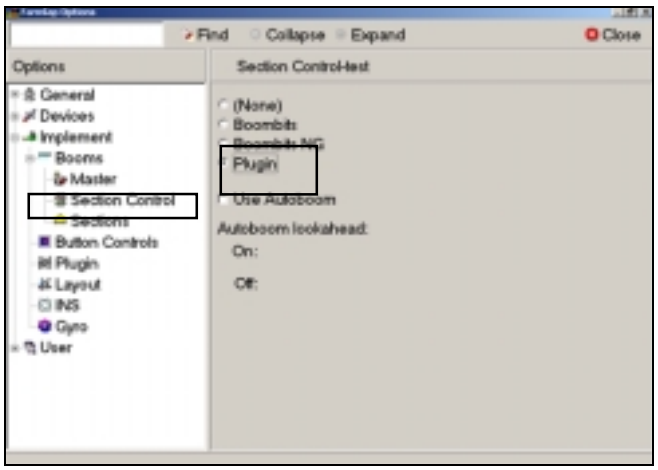
(CF-M34/18 ONLY)



2. Master

Your Boom Master will be **Boom Sections**.

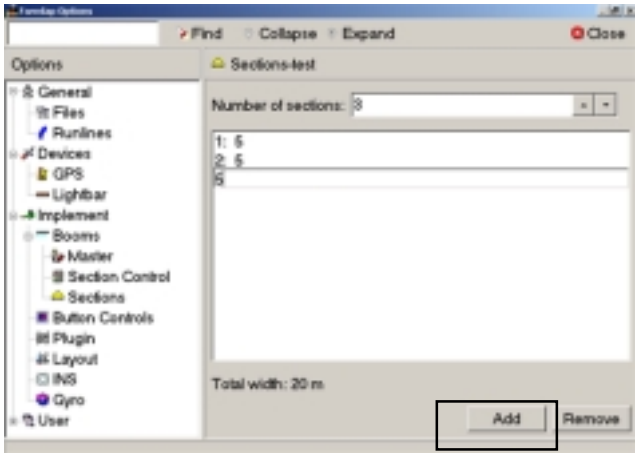
This tells your computer that the Plugin File with Boom Sections will control your boom controller unit.



3. Section Control

Your Boom Section Sensing will be **PLUGIN.**

This tells your computer to use the DLL file (selected previously) to be used as the Interface between Farmlap and your controller.



4. Section

Using the **ADD** button, add the correct number of sections in the "Number of sections" box.

Then click each section in the box below to change their widths to suit your machine.

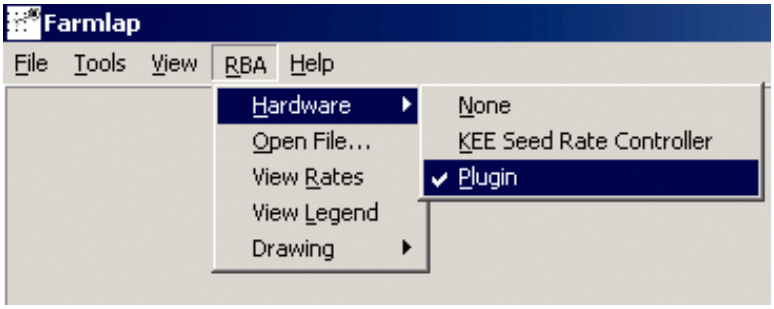
4. Press 

to continue.

14.0 ENABLE PLUGIN

Next you need to Enable your Plugin File so Farmlap knows to use it.

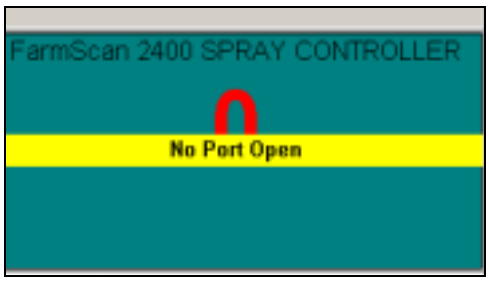
From the **Menu** bar, select **RBA | HARDWARE | PLUGIN**



Depending on the Plugin file that you have selected Farmlap will now enable the interface and your Farmlap screen will look something like the picture below.

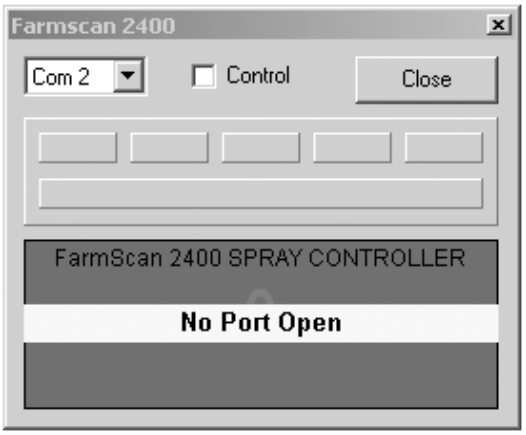
15.0 TROUBLE SHOOTING INTERFACE

If your Plugin File shows the following message please follow the instructions below.



NO PORT OPEN

No port open means that the COM port selected to talk to your interface is incorrect.



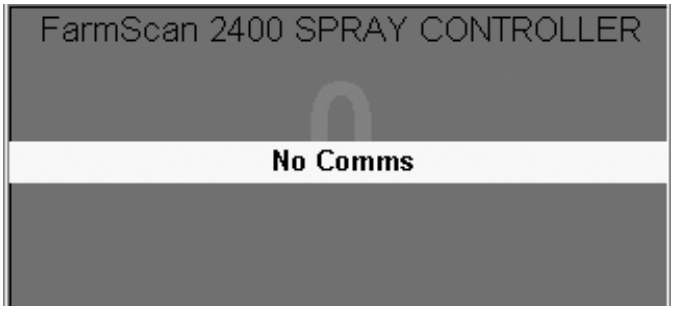
To change the COM port -

1. Click on **NO PORT OPEN**
2. Change Com to the correct Port.
3. It cannot be the same comport as the GPS

If you are unsure of the Com Port number, contact Farmscan to talk to a technician.

2. NO COMMS

Once the comport is changed & your monitor displays NO COMMS, please check your wiring from the Farmlap to your spray controller, and check that your controller is turned on. If using a 2400 Spray Controller ensure that it is set to AUTO or OPEN. (Not CLOSE)



16.0 GETTING STARTED

1. Turn your CF-18 on using the power button.

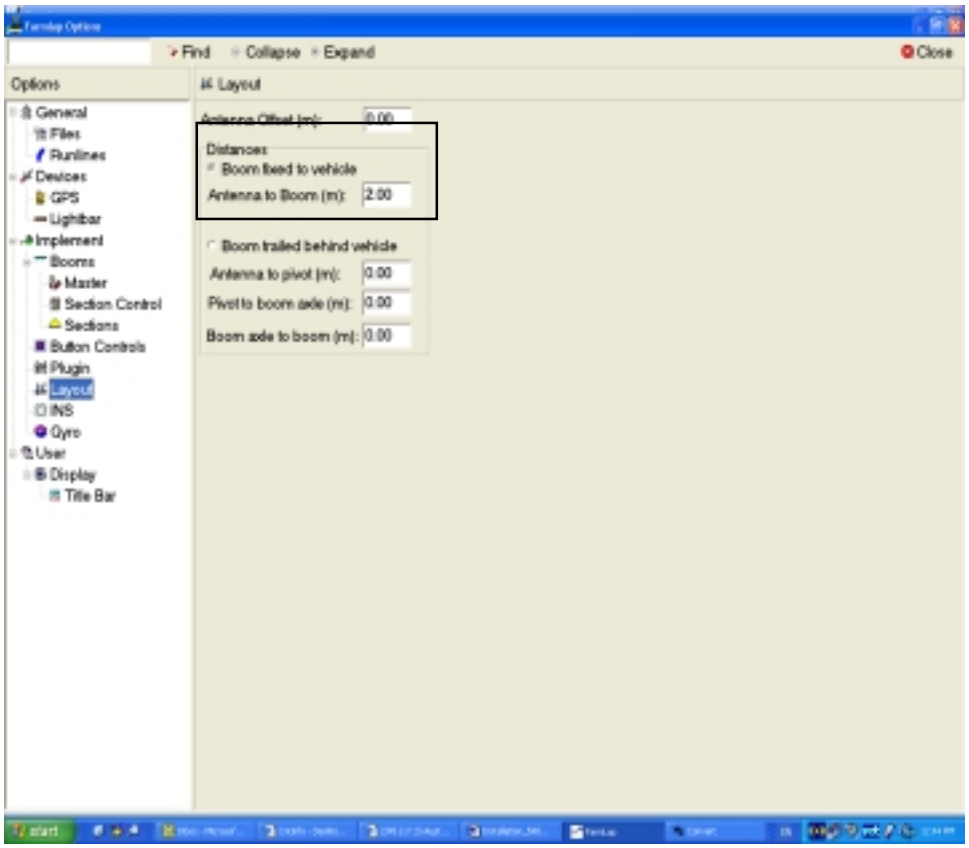
2. Then power on your OmniStar GPS Receiver. The GPS may take 3-4 minutes to initialise if it has not been used for sometime or has been moved a considerable distance without being turned on.

3. Once the computer has started up, double click the Farmlap icon on the desktop.

17.0 FARMLAP SETTINGS

1. Go to **View**, **Options**. Then click the "Expand" button to display all the setting options.

2. Click **Layout**, click **"Fixed"** and enter an antenna to boom distance if you have a vehicle mounted boom or spreader truck.

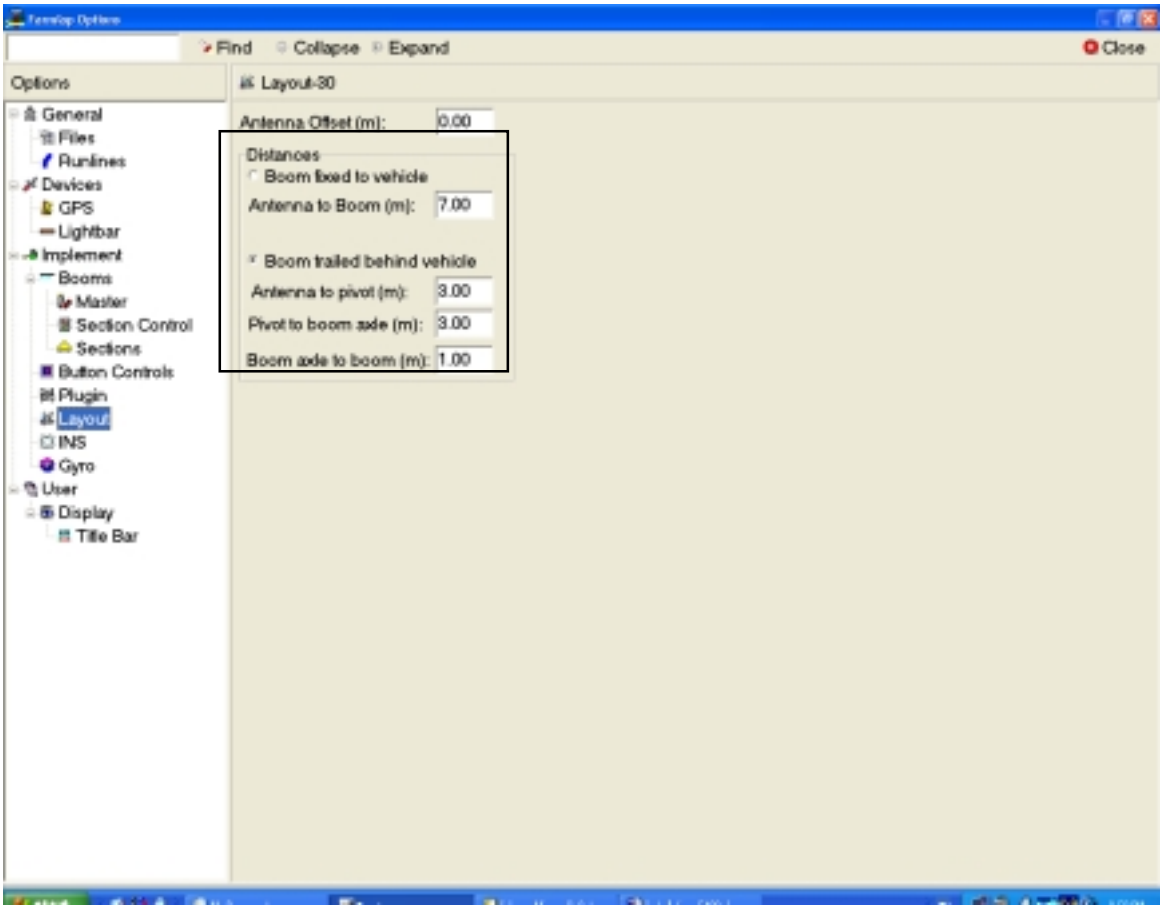


3. Click "**Trailed"** if the boom is towed behind the vehicle. There are three measurements needed.

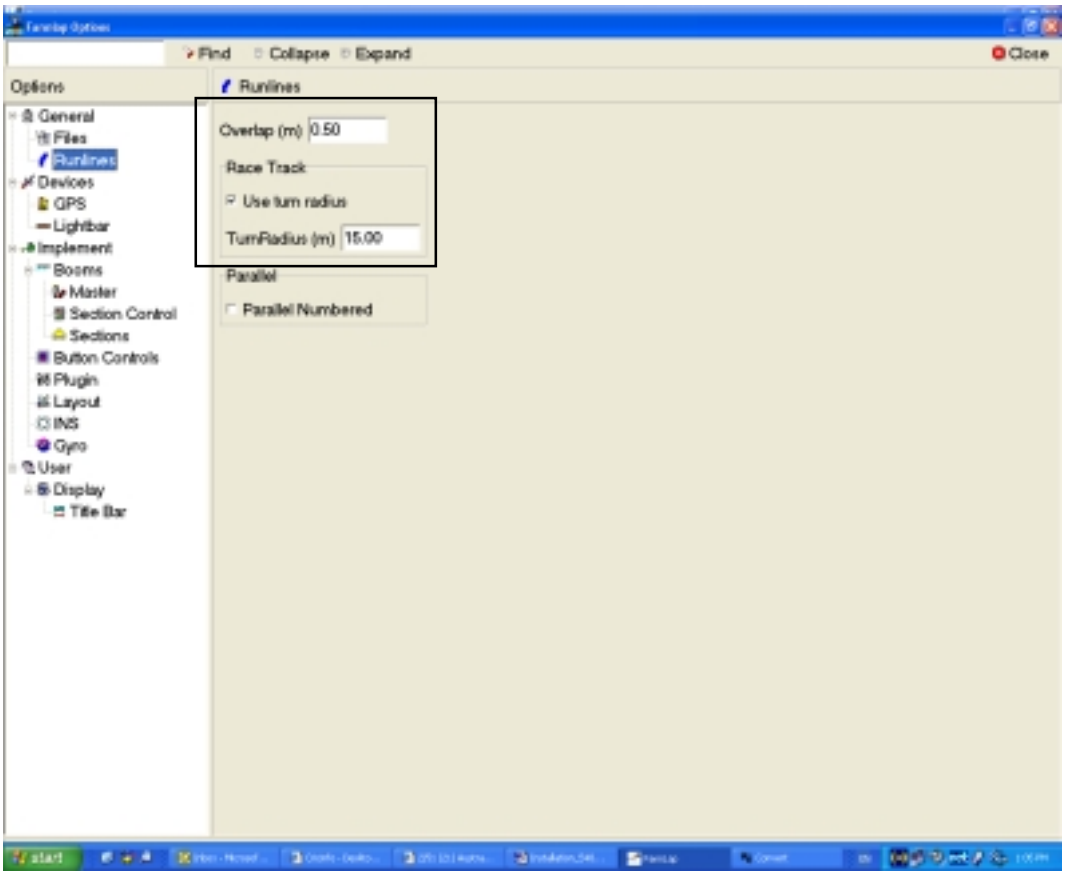
1. Antenna to pivot 2. Pivot to Boom axles 3. Boom axle to boom.

You will need to put a positive figure in the fixed box to display the yellow vehicle icon.

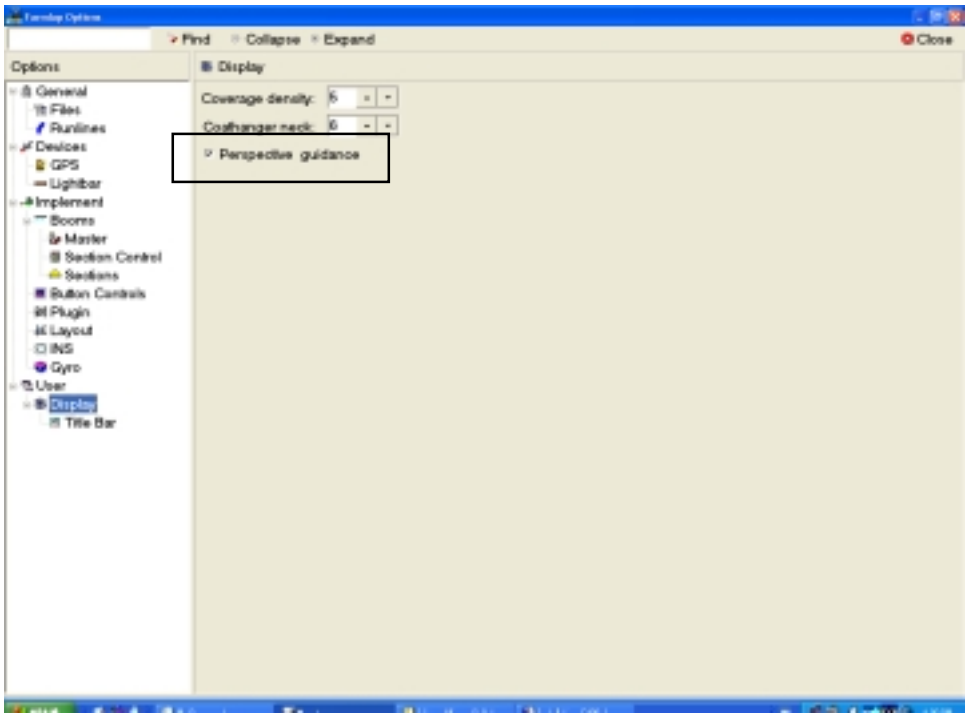
Ensure that the 3 figures entered in the Boom Trailed add up to the same value that is in the Boom Fixed to the vehicle.



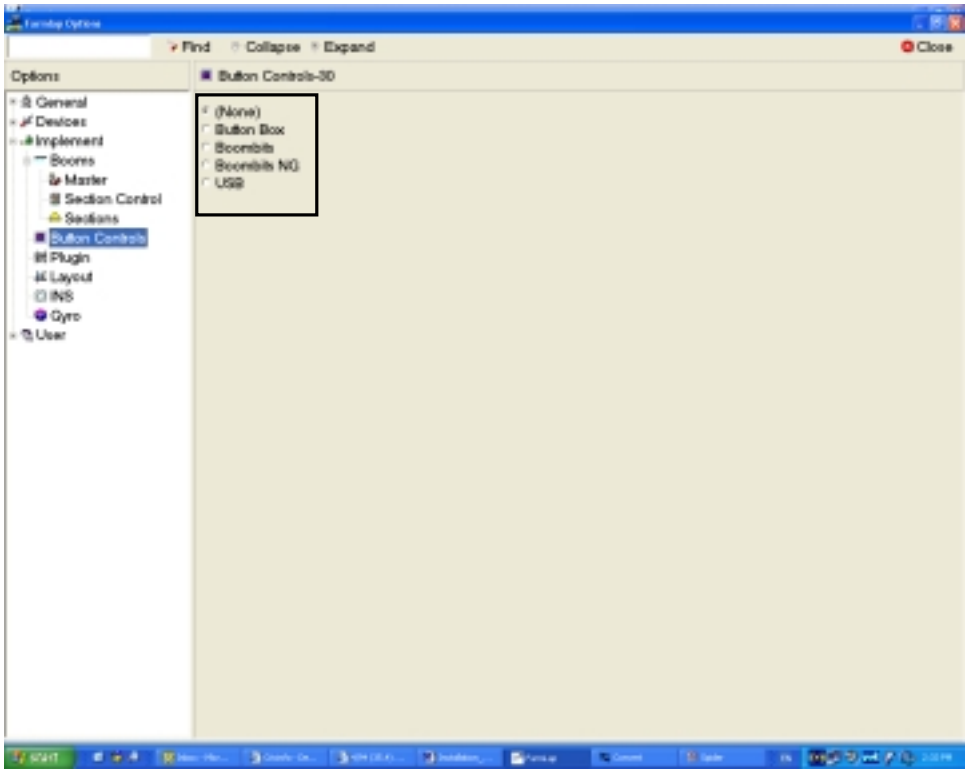
4. Click **Runlines** and tick the **Use Turn Radius** box to round your corners. Enter a figure between half and your full swath width in the **Turn Radius** box if you are using this function.The **Overlap** is normally setup as 0.50 metre overlap.



5. Click **Display,** tick **Perspective Guidance** if you want the blue highway in Racetrack mode.

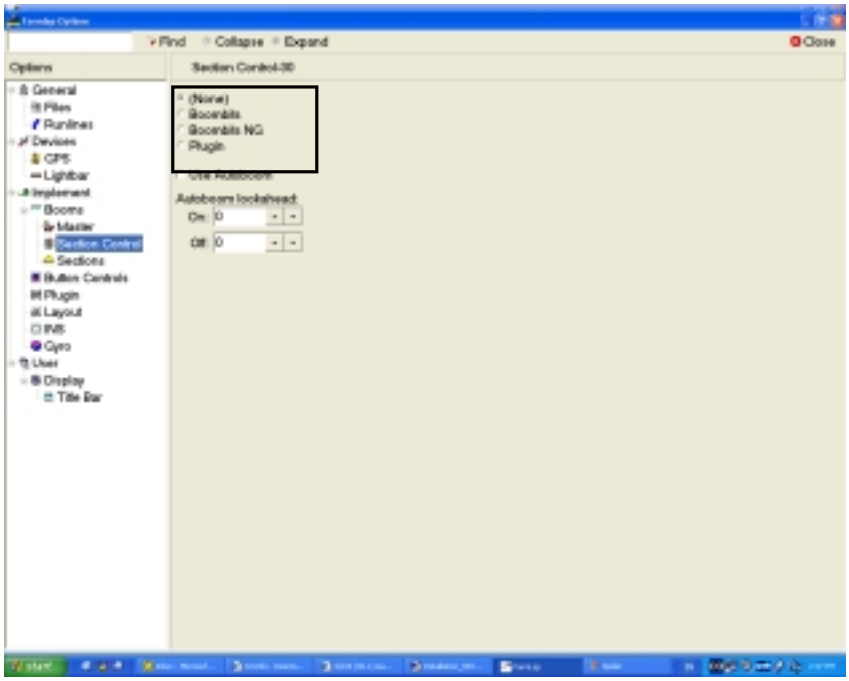


6. Click **Button Control**. If you are not using the Button Box select **None** for **Control Device**, otherwise you will need to select **USB.**



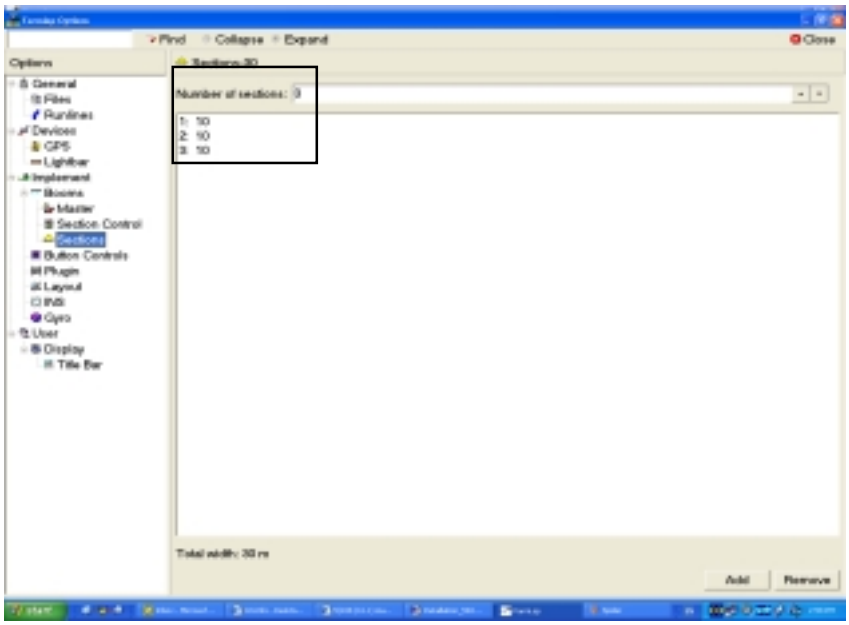
7. Click **Section Control**

- If you are spraying and have a **5300 Boom Section Interface**, select **Boombits NG.**
- If you have a **Serial Interface**, select **Plugin**.
- If you are operating without an interface select **None.**



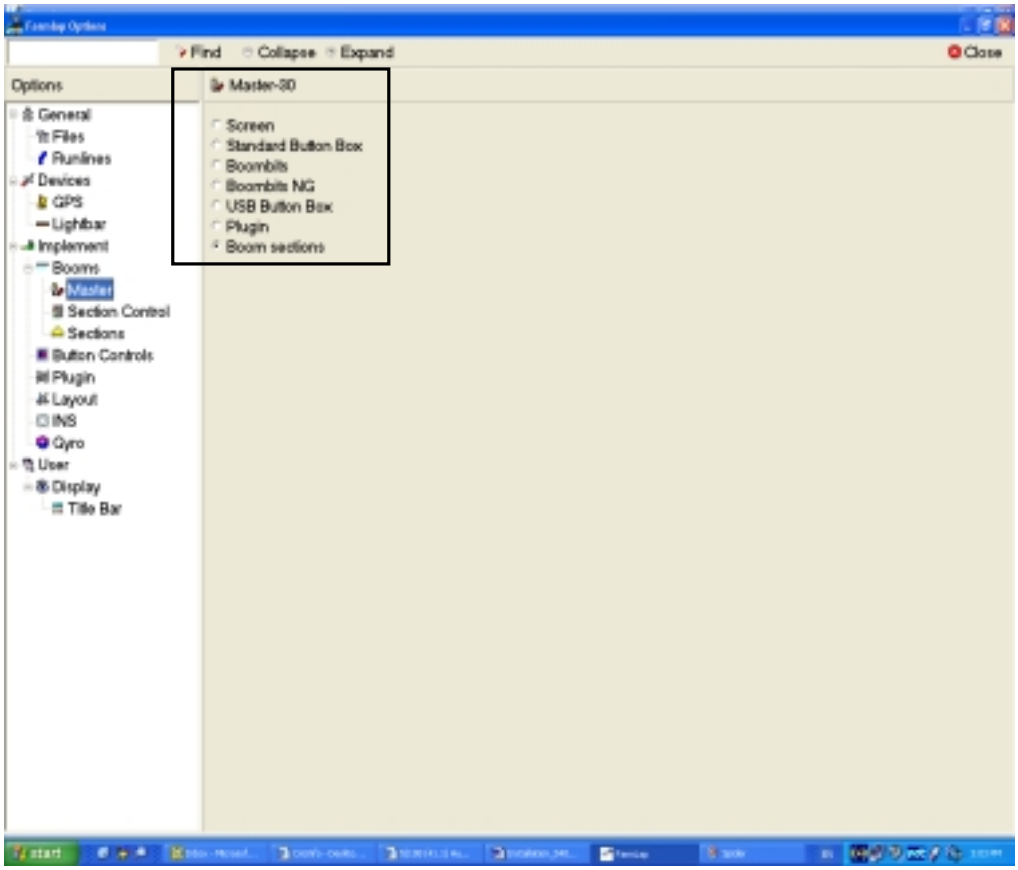
8. Click **Sections**

- Enter the number of sections in the **Number of Sections** field.
- Enter your boom section widths starting from 1 (section 1) to the last section. Check total width. If not using a Section Interface (eg 5300), set the number of sections to 1. Make sure the total width of the machine is entered.

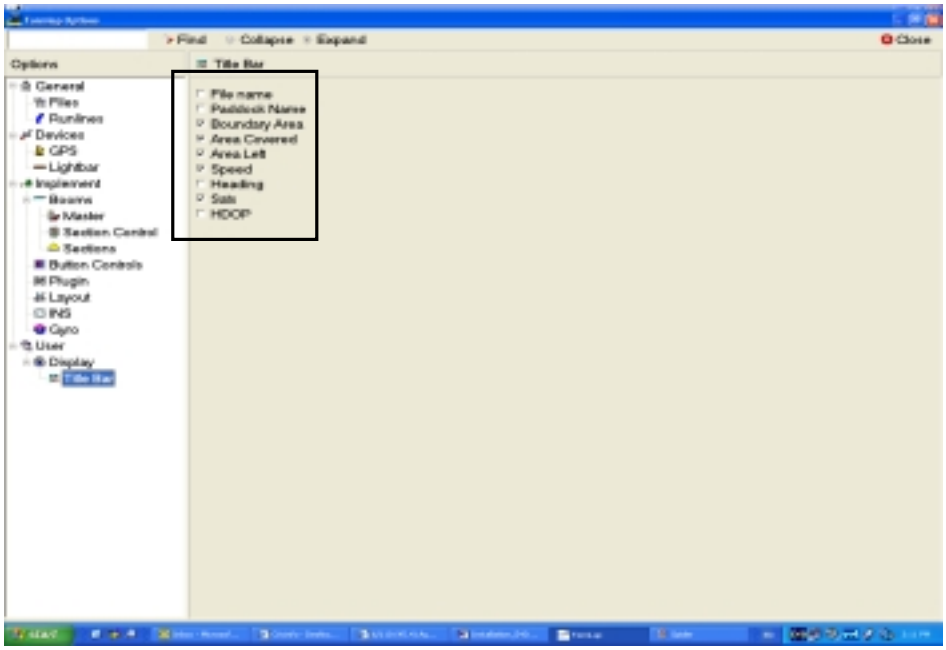


9. **Master**

- If you are using a **5300 Boom Section Interface** select **Boombits NG**.
- If you are using a **5300H Hardi Boom Section Interface** select **Boombits NG**.
- If you are using a **Conventional Boom Section Interface** select **Boom Sections**.
- If you are using a **Serial Interface** with a **Spray controller** select **Boom Sections**.
- If you are using a **Serial Interface** with a **Spreader Control** select **Plugin**.
- If you do not have the above Interfaces select **USB Button Box**.

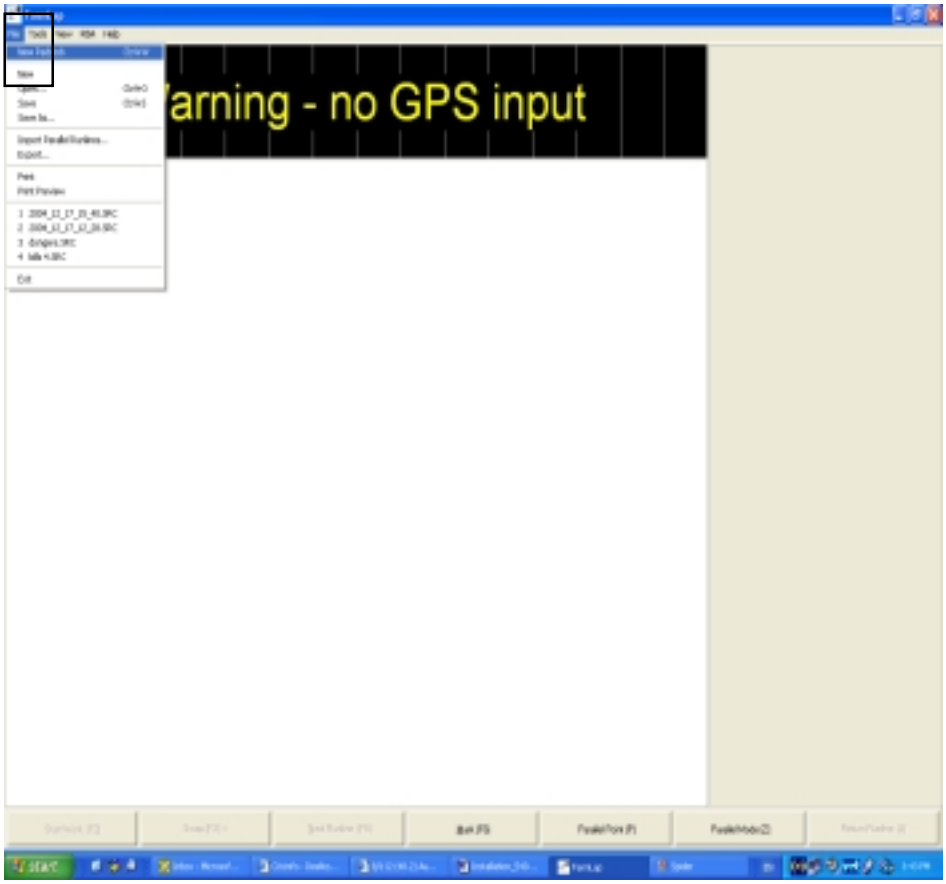


10. **Title Bar** allows you to choose what statistics you can view whilst operating Farmlap. Select only what you need as the screen can become cluttered & very difficult to read.



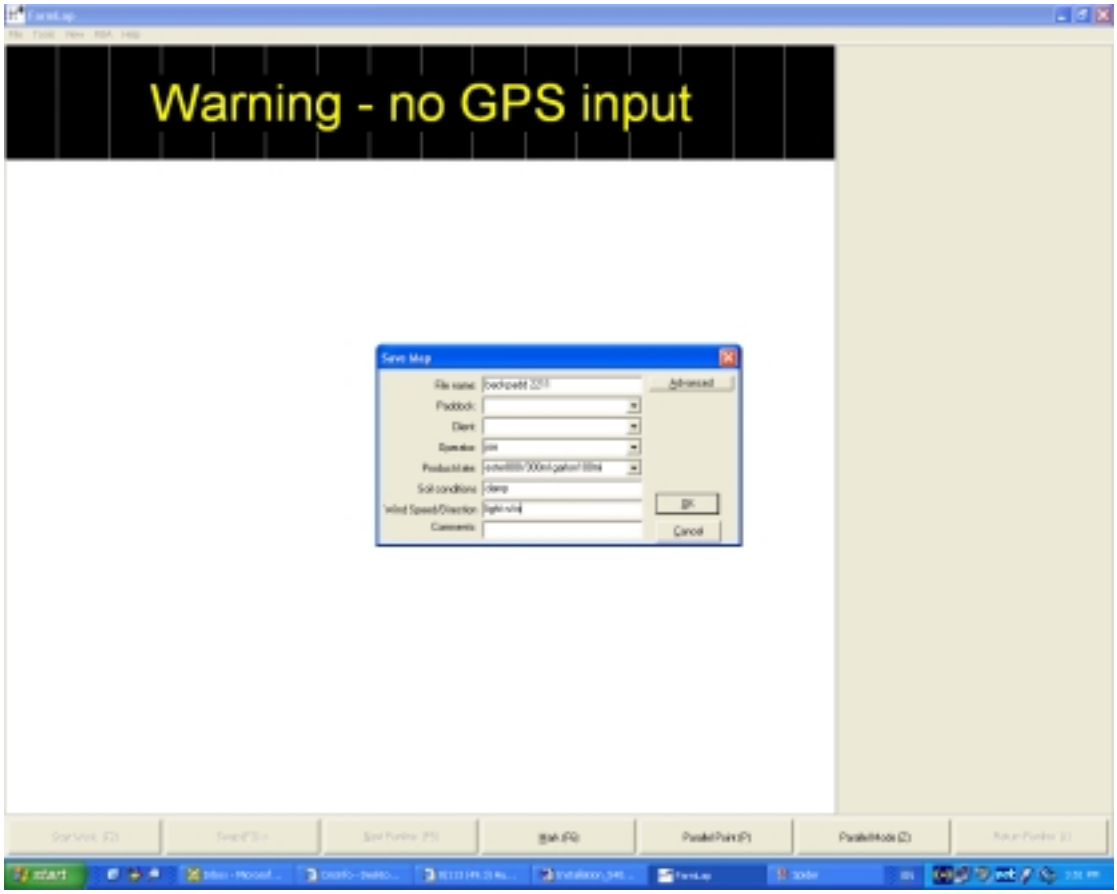
11.1 **Operating Farmlap - Starting New Paddock**

- Select **File, New Paddock**.



11.2 A dialogue box appears. Next to the **File Name** field is a date and time stamp. If this is sufficient information press **OK** and you are ready to start work.

- To save the file under your own system, double click the cursor in the **File Name** field, and then type the file name ie. "Backpadd 2211", where 2211 is the date. This makes it easy to find the file at a later date.



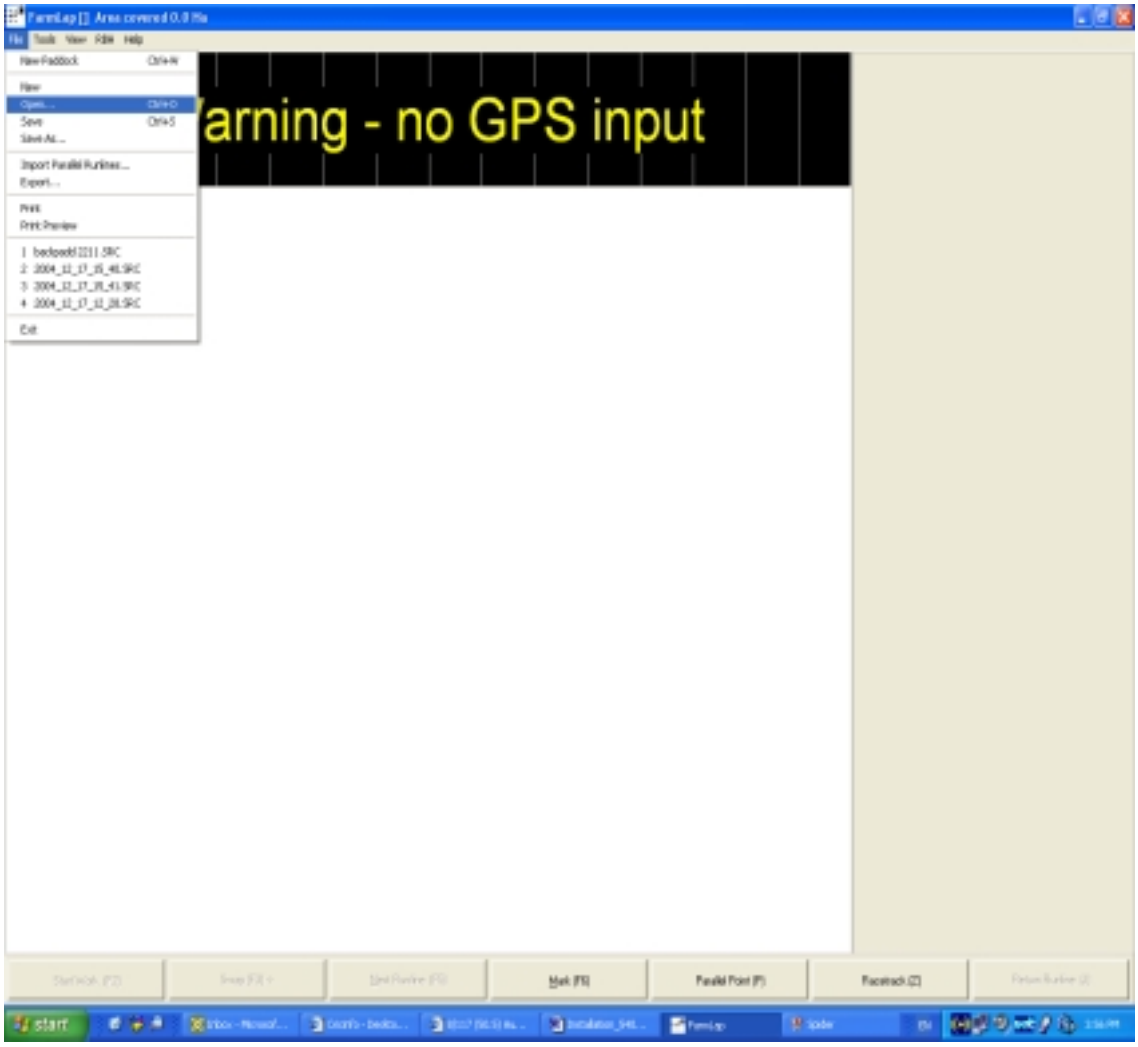
Remember: To save a file it needs a file name. Entering information in the Paddock line does not become the file name.

To type information into the other lines use the Tab button. The more information you enter the easier it is to find the file later. If you enter all your paddock names in the picklists in **Options, Picklists**, you only need to select the paddock instead of typing them in each time.
***** Once you have finished entering information, press **OK** and you are ready to start work.

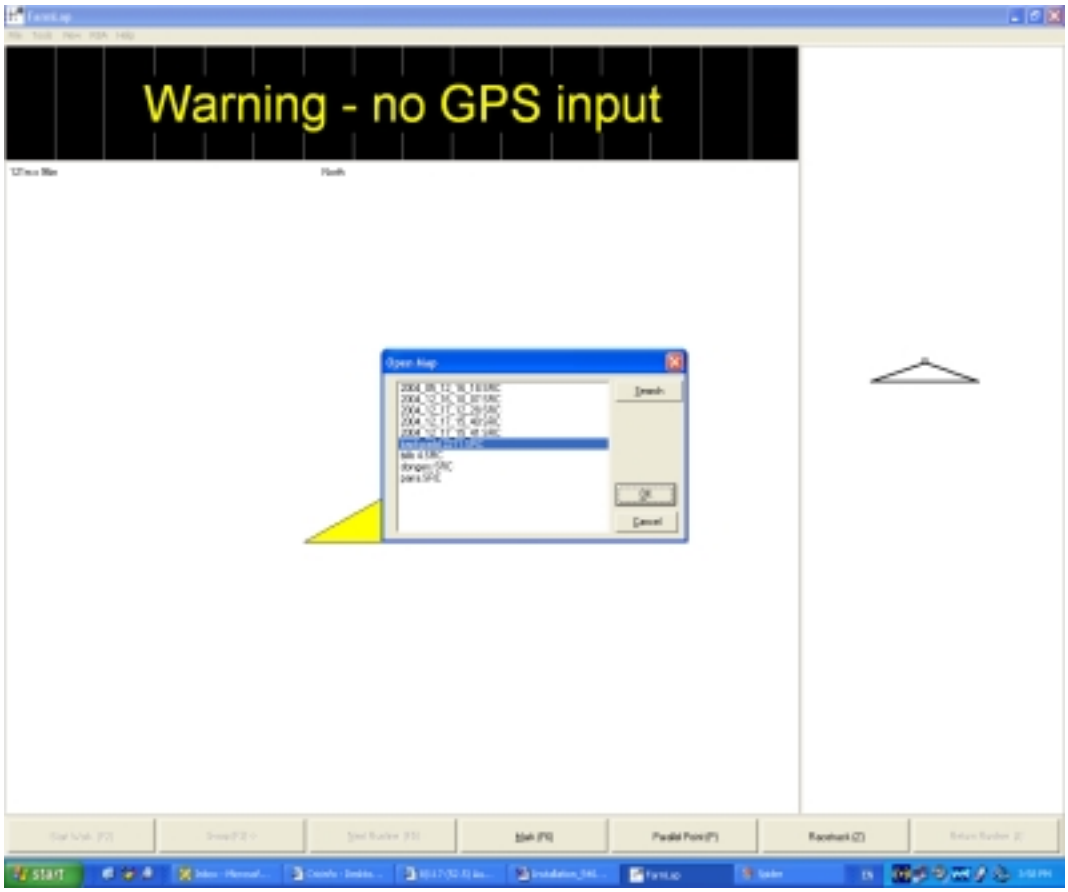
12.1 **Open Existing File or Paddock**

Select **File, (**Ensure the units master is turned off before hitting) **Open.**

Do not use File/New.

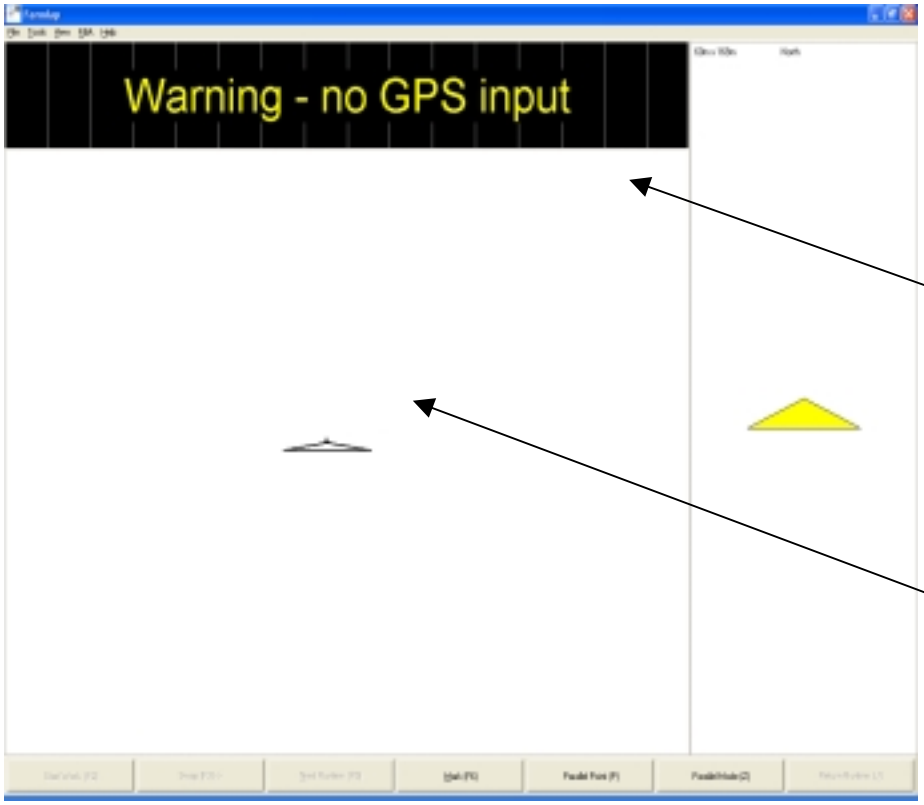

arning - no GPS input

12.2 A dialogue box appears with all your Farmlap paddock files. Select the file you need and click on it to highlight it. Press **OK**, the map will appear and you can start where you left off.



13. **Swap Guidance Screen with Coverage Map**

Place the cursor on the lightbar and left click once or simply touch the screen on the lightbar with your finger. When the yellow icon has swapped sides you simply single right click in the main screen & the coat hanger will swap sides. The screen will look similar as below.



Left click mouse here or touch the lightbar.

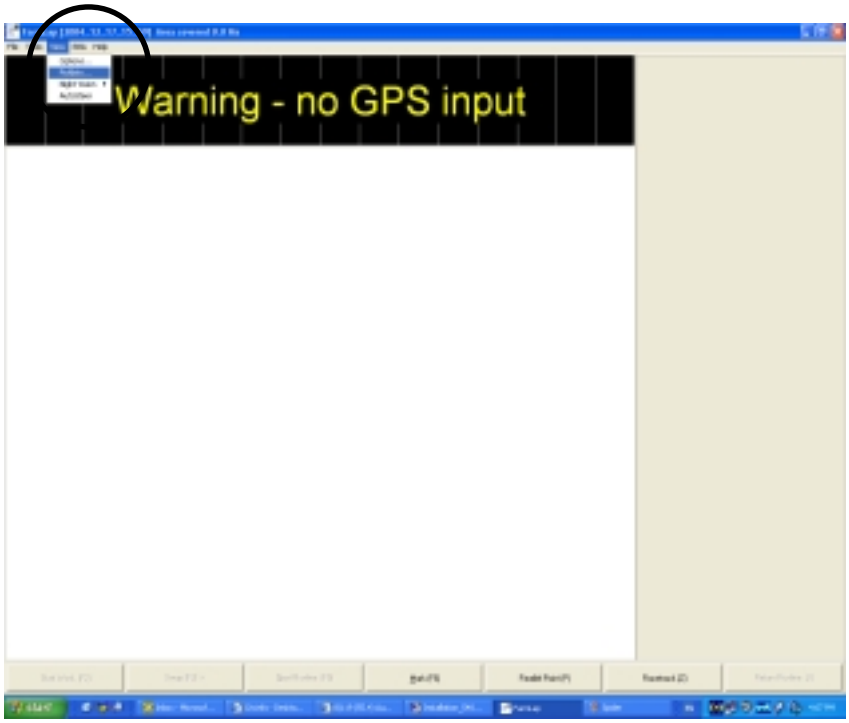
Right click mouse here to swap coathanger

To return the screen back to the original, simply reverse the above procedure.

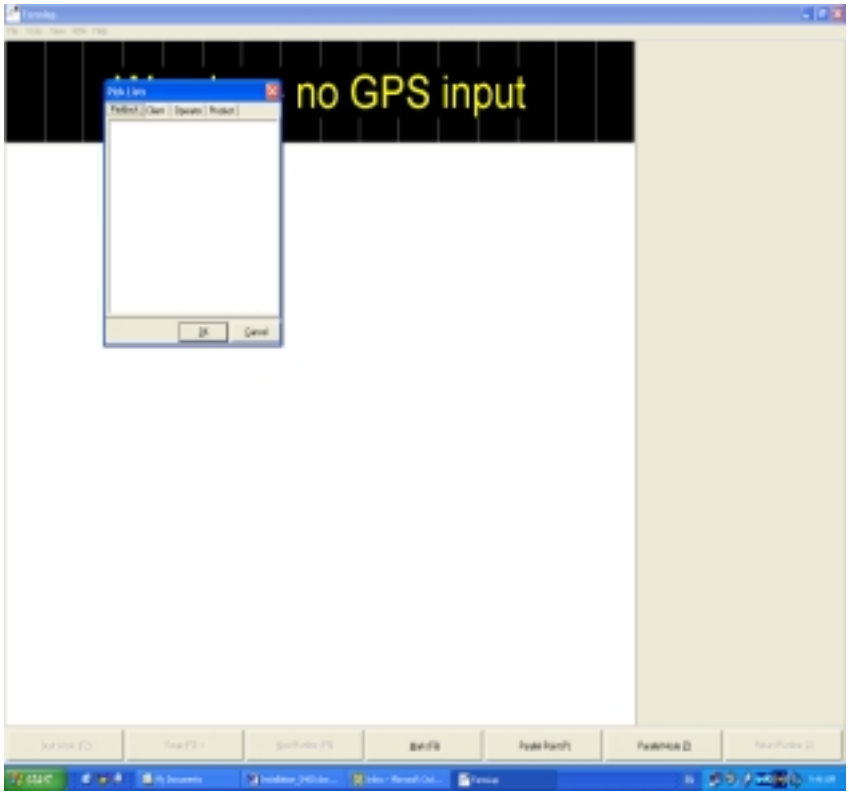
14. **Reset Boundary**

Allows the operator to recalculate the area they are spraying, whilst the area covered continues to total. Very useful when there are contour banks in a paddock the operator needs to know the area of each piece. Select **Tools, Reset Boundary** and start working. The boundary calculation will reset and be completed when the vehicle completes the lap by passing through the point where it started.

15.1 **Adding to Picklists**
Select **View, Picklists** from the tool bar.



15.2 Select which picklist you wish to add to. Place the cursor in the box and left click, then type in the appropiate word. Press enter at the end of each name. You will need to enter a whole tank mix on one line as you cannot select individual ingredients. **!!**A good tip is to enter in alphabetical and numerical order for easy retrieval **!!**



16. **Printing Maps**
To print a Farmlap map select **File, Open**. Choose the file and press **OK**. Select **File, Print.**

17. **Exiting Farmlap**
Before exiting Farmlap it is recommended you save your work. Select **File, Save.**
To exit Farmlap select **File, Exit**, or click on the '**X**' in the top right hand corner.

18.0 POWER CONNECTION QUICK GUIDE

The main 5 meter power cable needs to be fitted direct to the machines battery and the inline fuse fitted.

The cable then plugs into the 3 way power splitter box. All other connections go to the computer and gps through the 3 way splitter box.

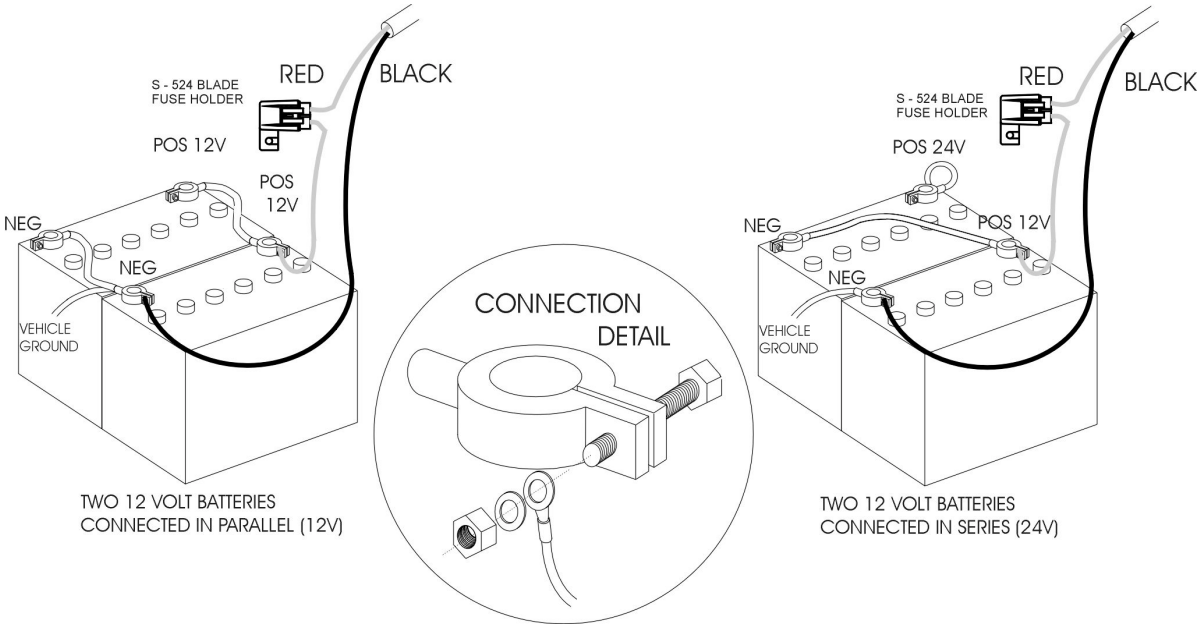
The inline 10 amp blade fuse protects the system from short circuits etc.

Follow the guidelines below when connecting to power.

- Do not connect power until all other installation is finished.
- Connect **direct** to 12 Volt DC battery terminals, red wires to positive (+) and black wires to negative (-).
- Do not connect the power cable to a starter motor, alternator etc, as this may cause interference.
- Do not connect the power cable's negative direct to the chassis of the machine – it must be connected to the battery's negative terminal.
- Do not join other instruments off the controller power cable. Such as a two way radio.

- Use the provided cable ties to secure the power cable safely away from hot or moving parts.
- Connection to battery terminal bolts must be kept clean and tight. See the diagram below for typical battery connection schemes.

TYPICAL BATTERY-UP USING THE 5m CABLE



19.0 WHERE TO OBTAIN SUPPORT

For any enquiries regarding the performance of your Guidance System please contact:

Farmscan Service Department
6 Sarich Way, Bentley, WA, 6102
Tel: (08) 9470 1177 Fax: (08) 9470 2855
E-mail: service@farmscan.net.au
www.farmscan.net.au