Precision Farming System

PF3000

Operators Manual

Welcome

Welcome to the ***Ag Leader Technology*** family. ***Ag Leader Technology*** is dedicated to the development of advanced, yet practical and cost-effective tools for grain production. Above all, however, we are dedicated to meeting your needs for support of existing products and development of product improvements.

We want to hear from you! Feel free to call any time to discuss:

- Operational problems with your system
- Features you don't like about your system
- Features you would like added to your system

We will do our best to ensure that you are happy with your current system and that it is upgraded in the future to better meet your needs.

System Upgrades

Ag Leader Technology will periodically provide free operating program upgrades that will improve the performance of your PF3000.

To receive free upgrades and new product news, you must send in or fax (*515-232-3595*) the Registration Form that is at the beginning of the operator's manual. Our mailing address is:

Ag Leader Technology
2202 South Riverside Drive
P.O. Box 2348
Ames, IA 50010

Internet http://www.agleader.com

Limited Warranty

Ag Leader Technology will repair or replace at no charge any component of the PF3000 system that fails during normal service on the equipment model that the system was intended for use within two years from the date of first use.

Warranty is not provided for damage resulting from abuse, neglect, accidents, vandalism, acts of nature, or any other causes that are outside the normal, intended use of the PF3000 system.

Ag Leader Technology shall not be liable for indirect, incidental, or consequential damages to the dealer, end user, or third parties arising from the sale, installation, or use of the PF3000 system.

Service

If you have a problem with your system, call your ***Ag Leader Technology*** dealer or call us directly at the phone number below. If we determine you have a hardware failure, we will ship replacement hardware immediately. Our mailing address and phone numbers are:

Ag Leader Technology
2202 South Riverside Drive
P.O. Box 2348
Ames, IA 50010

Phone: 515-232-5363
Fax: 515-232-3595

*Note**:** Return failed hardware to us by UPS (preferred) or US mail.*

Copyright Notice

Proprietary Technology Notice

The PF3000 system has patents on its design and operational features. Copying features of this system relating to measurement and calculation of grain flow and weight, or organization of field and load data may result in patent infringement.

General Description

The PF3000 is a universal monitor/controller for crop production that is GPS compatible. It can be transferred from a combine to a tractor or other vehicles easily. In the combine it functions as a yield monitor and accurately measures and records acres, moisture, grain weight, bushels, and yield on-the-go. In the tractor or sprayer it connects to a sprayer or planter controller and monitors and controls the application rate. The PF3000 also can record data for field boundaries, tile lines or where a hybrid is planted.

The PF3000 has its own internal memory for recording field and load data. **GPS data, however, is not recorded in the internal memory, but must be logged to a memory card**.

The PF3000 **must** be setup and calibrated to record accurate information.

> *NOTE: The Grass Seed version of the PF 3000 is setup and calibrated using the same procedures as for grain harvest. Where there are differences between the harvest of grain verses grass seed they will be noted.*

Fields and Loads

All the information recorded by the PF3000 must be recorded in a field and load. The operator must manually select or change the field and load on the PF3000 during field operation. A load is used to subdivide a field into smaller sections. The monitor load is not associated with the combine tank, wagon, or truck load. It is recommended to use different loads for different hybrids or varieties or field conditions (like a wet hole).

Keypad

The monitor has “soft” keys which do not have labels on the keys to identify the function of the key. The labels for the keys will appear on the display screen next to the key. However, there are four major groups of the keys: arrow keys, display selection keys, menu key, menu selection keys.

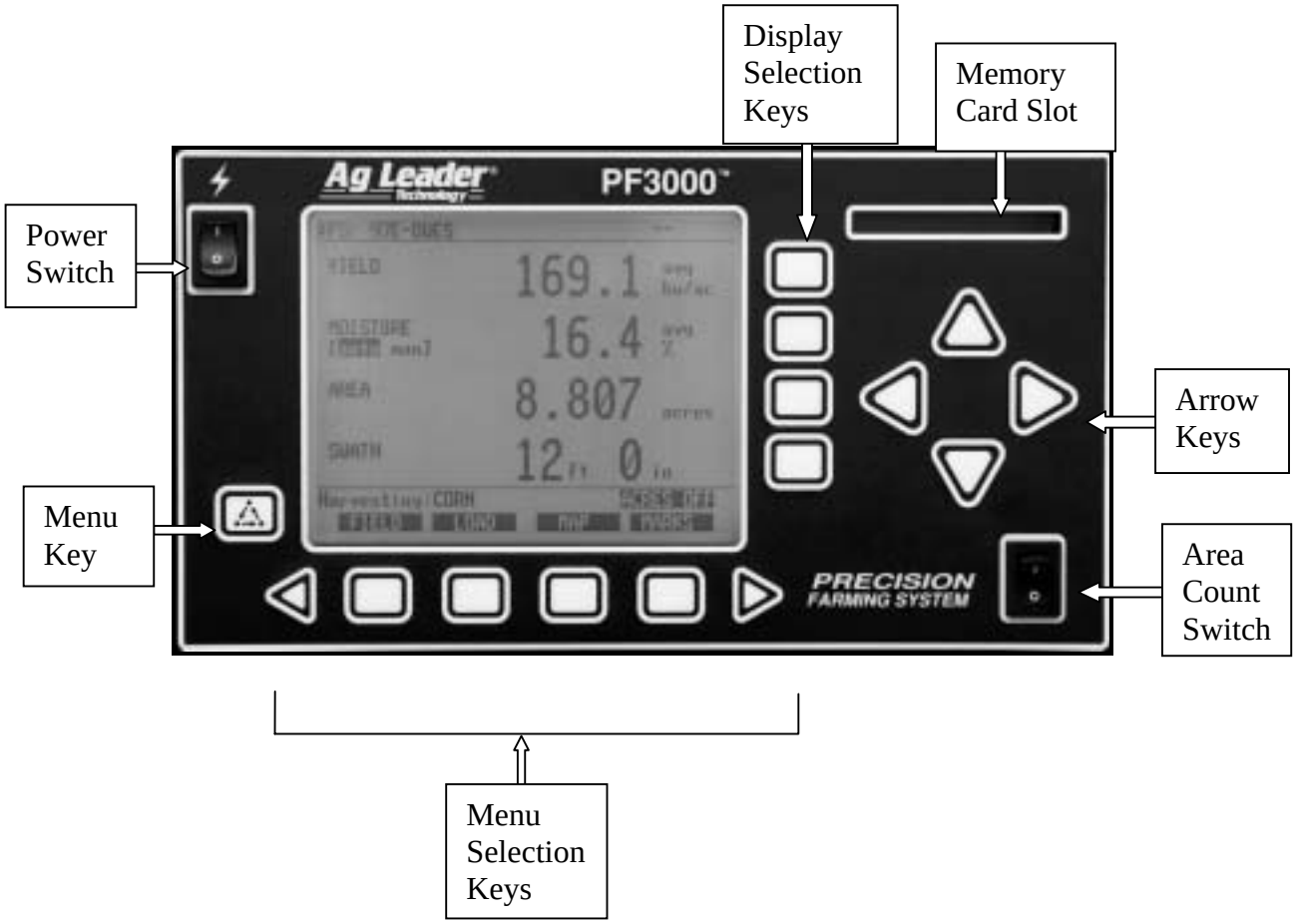


Figure 1: Front panel of the PF3000

Arrow Keys

The UP, DOWN, LEFT and RIGHT ARROW keys on the right side of the keypad are used to select and change a setting. The bottom LEFT and RIGHT ARROW keys are only used to view more menu or display items. They are never used to select or change a setting.

On the main operating screen, you will see an up and down arrow symbol that will either be beside the field or load or to the right of one of the display lines. This symbol indicates what item the UP or DOWN ARROW keys will change if pressed.

Display and Display Selection Keys

The PF3000 has four display lines for viewing items on the main operating screen. You can choose which items you see on the display and the position that the items appear on the display.

To change a display item on a display line you must select the line. The four display selection keys to the right of the display each select a display line. A rectangular box surrounds the display line to show that it is selected.

When the display line is selected the four menu items on the bottom change and show items you can select for display. Press a key below one of the four display items to put a different display item in place of the selected display item. There are more than four display items to choose for viewing. Press the bottom LEFT or RIGHT ARROW keys to scroll to the right or left and view other display items on the bottom.

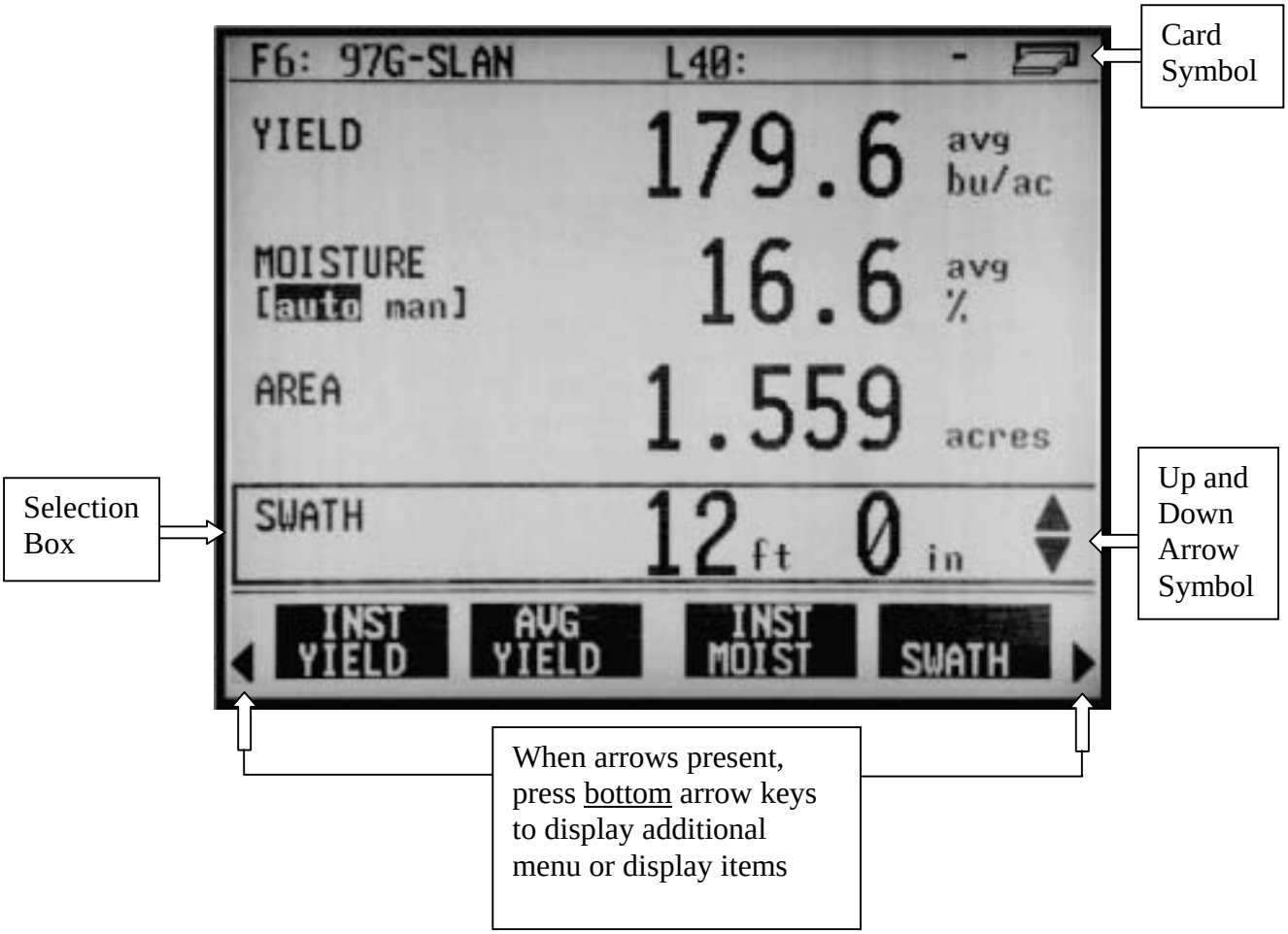


Figure 2: Main operating screen

When some display items (like swath) are selected, an up and down arrow

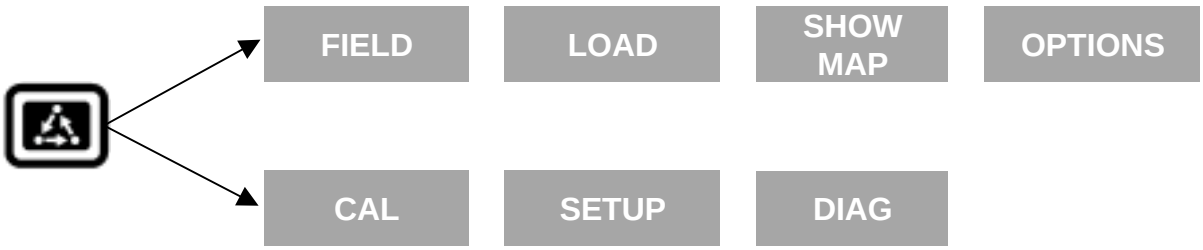
symbol will appear on the right of the display line. This indicates you can change the setting of the item with the UP or DOWN ARROW keys. After you have made the change you must press the key to the right of the display line to deselect the line.

Menu Key

The MENU key switches the menus on the bottom of the display. There are two main menus that you can view by pressing the MENU key. They are shown below.

It is recommended to display the FIELD, LOAD, MAP, and OPTIONS menu during normal operation of the monitor, unless you are marking and therefore need to display marks on the bottom.

Main Menus:



Menu Selection Keys

The name above the four menu selection keys on the bottom of the display will change depending on what you are doing on the monitor.

The bottom RIGHT and LEFT ARROW keys are used to view additional menu or display items. If you see a right and left arrow symbol on the display above the bottom RIGHT and LEFT ARROW keys, this indicates you can press the bottom RIGHT and LEFT ARROW keys to view more menu or display items. Refer to Figure 2.

Area Count Switch

The area count switch manually turns on and off area counting. When the switch is in the up position area is counting. When the switch is in the down position, area is not counting. The monitor will display either "AREA ON" or "AREA OFF" on the bottom right corner of the display to indicate the status of area couting.

Connectors

The PF3000 has four connectors on the bottom side of the console. The large 25-pin connector is for power and sensor connections. The three 9-pin ports (Port 1, Port 2, Port 3) are for connecting to a GPS receiver, planter or fertilizer or sprayer controller or any other GPS compatible device.

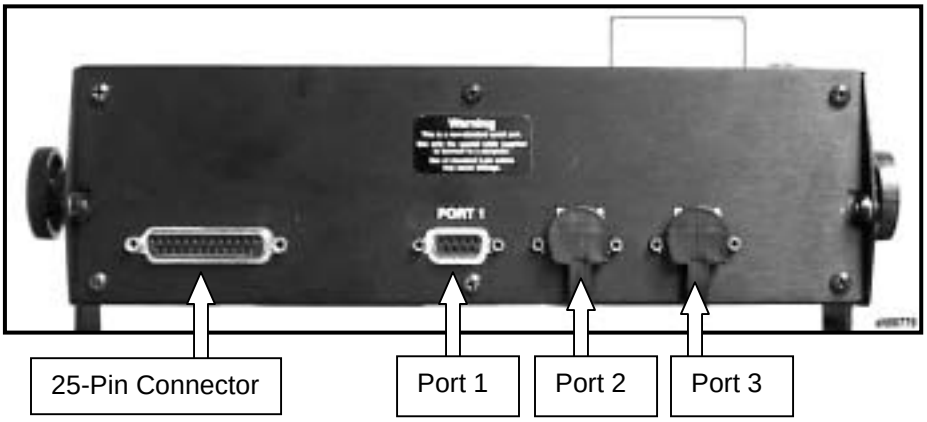


Figure 3. PF3000 Connectors

Grain Flow Sensor

Below is an example of a grain flow sensor. Your grain flow sensor may look different, depending on which combine model you have. On all combines, the grain flow sensor installs on top of the clean grain elevator. The grain flow sensor measures the grain weight in pounds as you harvest. The clean grain paddles throw the grain, as the paddles rotate around the top sprocket, toward the grain flow sensor. The flow sensor measures the grain weight when the grain strikes the flow sensor impact plate.

NOTE: The flow sensor for grass seed harvest function in the same manner as the grain flow sensor. The grass seed flow sensor differs only in appearance.

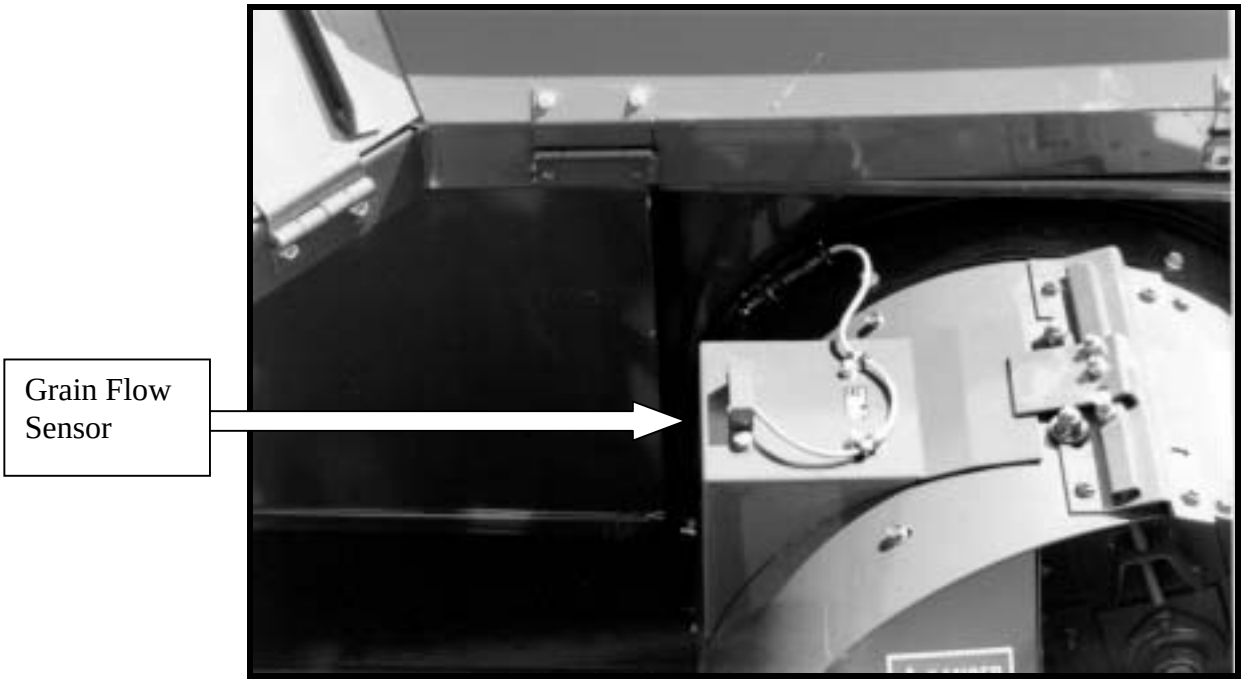


Figure 4: Grain flow sensor

Moisture Sensor

Below is an example of the moisture sensor mounted on the side of a clean grain elevator. The moisture sensor is installed in the elevator mount kit.

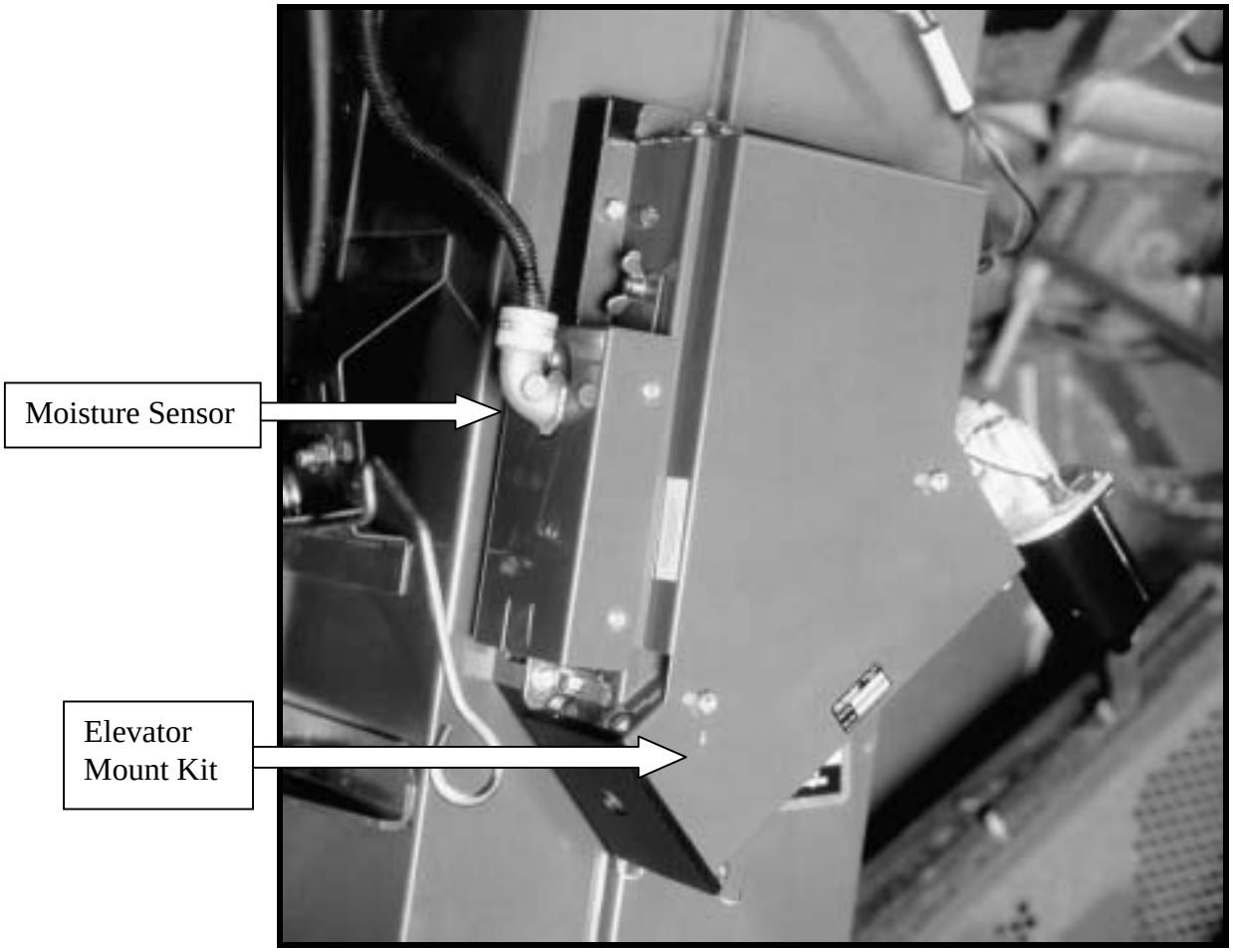


Figure 5: Moisture sensor

Header Height Sensor

Below is an example of a header height sensor installed underneath a combine cab. The header height sensor tells the monitor the position of the combine head so that when the head is raised on the end rows, the monitor stops counting area.

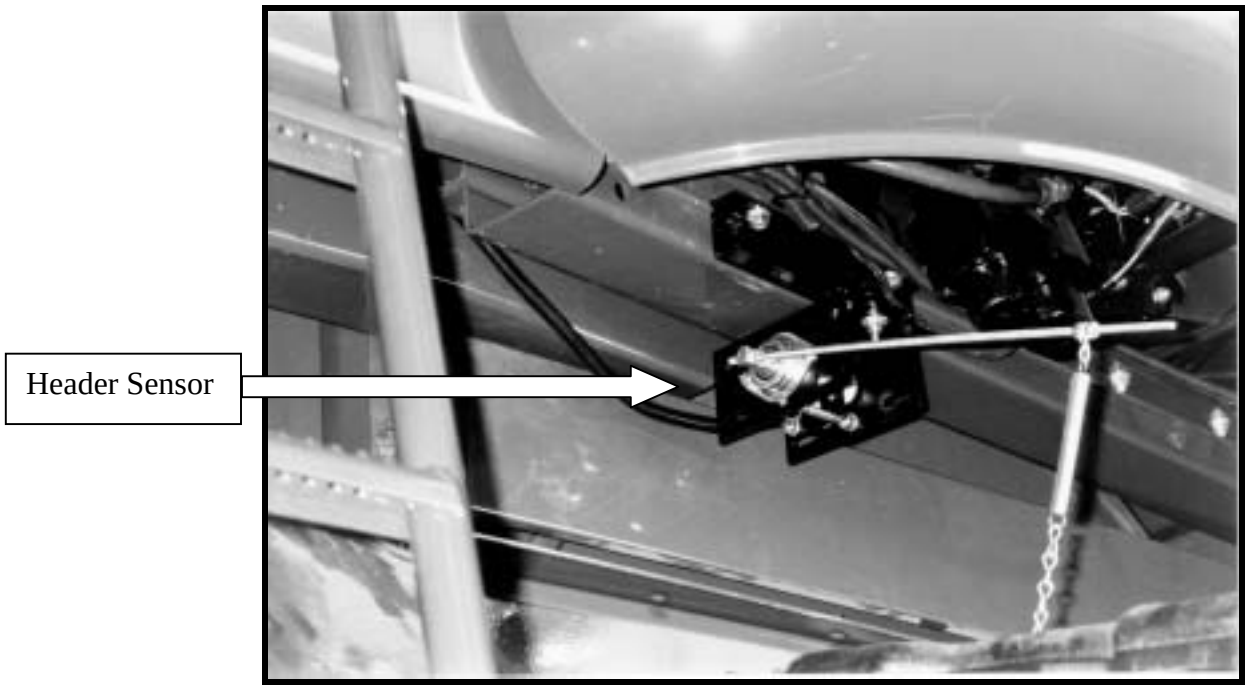


Figure 6: Header height sensor

* * *

Important Notices

The PF3000 must be set up before field operation, but before you begin the setup procedures, read the following notices:

- The PF3000 is a software upgradeable monitor. ***Ag Leader Technology*** will periodically offer free operating program upgrades to increase the capabilities of the PF3000. **To receive the program upgrade, you must send in the registration form found at the beginning of the operator's manual.**
- If you plan to make yield maps on your own computer, you will need to use a mapping program that can process files created by the PF3000.

Section Contents

This setup section contains instructions for the following items. The operating modes that the instructions pertain to are also listed.

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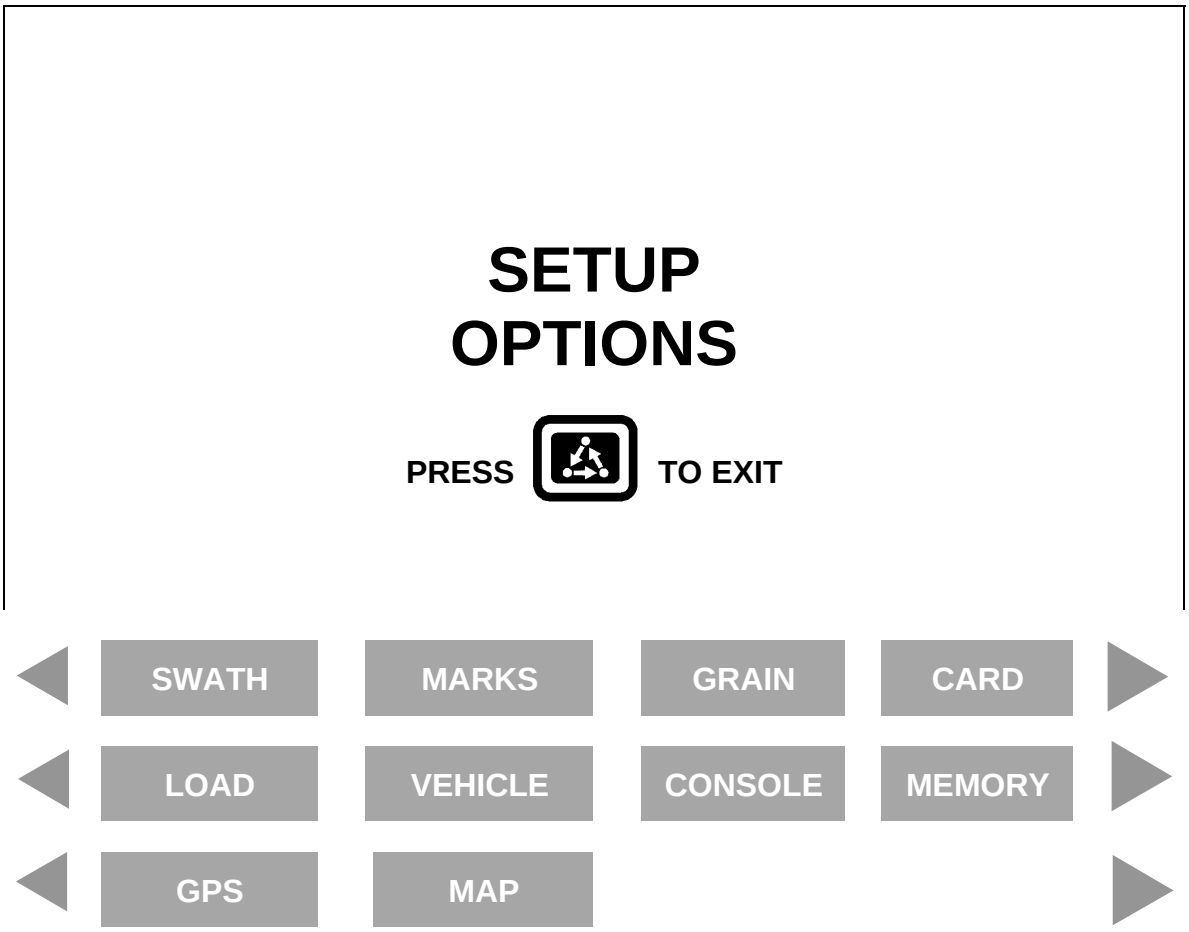
Using Power Supply

The PF3000 console does not need to be in the vehicle to set it up. You can use the provided power supply (plugs into 120v outlet) to power up the console inside your home or shop.

Order of Keys
(Harvest Mode)

Press the MENU key  until you see the following keys on the display.

Press the SETUP key to view the following setup menu items.



Press the bottom LEFT or RIGHT ARROW keys to switch between and view the setup menu items shown above.

Order of Keys (Site Verification Mode)

Press MENU key  Until you see the following keys on the the display.

CAL SETUP DIAG

Press the SETUP key to view the following setup menu items.

SETUP OPTIONS

PRESS  **TO EXIT**

SWATH MARKS CARD LOAD

VEHICLE CONSOLE MEMORY GPS

MAP

Press the <u>bottom</u> LEFT or RIGHT ARROW keys to switch between and view the setup menu items shown above.

Order of Keys
(Application Rate Mode)

Press the MENU key  until you see on the following keys on the display.

CAL | SETUP | DIAG

Press the SETUP key to view the following setup menu items.

SETUP OPTIONS

PRESS  **TO EXIT**

◀	APP.RATE CONFIG	MARKS	CARD	LOAD ▶
◀	CONSOLE	MEMORY	GPS	MAP ▶

Press the bottom LEFT or RIGHT ARROW keys to switch between and view the setup menu items shown above.

* * *

Introduction

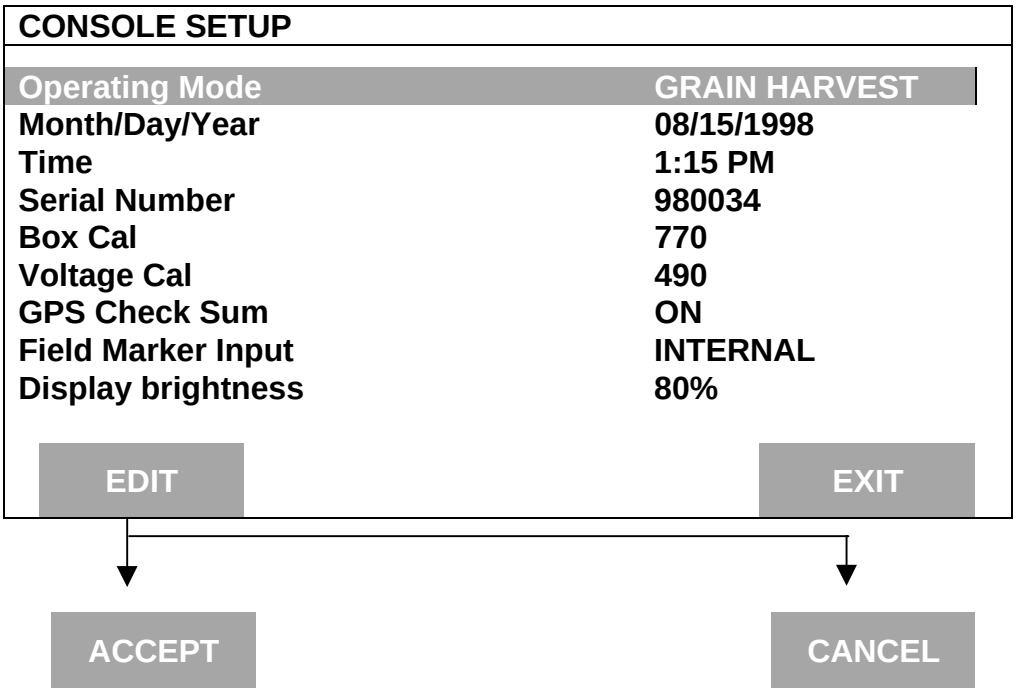
The console settings are general settings that apply to all operating modes and uses of the PF3000.

Console Setup Screen

To view the console setup screen press the:

MENU key 
SETUP key
bottom RIGHT ARROW key
CONSOLE key

Example of console setup screen:



Changing a Setting

Step	Action
1	Use the UP or DOWN ARROW keys to select the item you want to change. The item is selected when a black filled rectangular box surrounds the entire line.
2	Press the EDIT key and then use the UP or DOWN ARROW keys to change the number or setting.
3	Once you have changed a setting press the ACCEPT key. Press the EXIT key once you have made all the settings.

Adjust Display Brightness

To adjust the display back lighting, scroll down to "Display brightness" and press EDIT key. Use the UP or DOWN ARROW keys to adjust the screen brightness and press the ACCEPT key.

Operating mode

The PF3000 has the following operating modes: Grain Harvest, Grass Seed Harvest, Cotton Harvest, HarvestMaster™, Application Rate and Site Verification. Upon changing the operating mode you should make sure all setup items for that operating mode are correct.

Operating Program Firmware

To switch modes, you must install that modes operating firmware. The exception is Site Verification Mode. Site Verification is available with all other modes. See "Updating Operating Program" instructions in the Operation Section of this manual to load different firmware. All firmware versions are on the CD that that came with the monitor or on the web at www.agleader.com.

Serial number, Box calibration, Voltage calibration

The serial number, box calibration number and voltage calibration number can be found on the bottom side of the monitor. These numbers should be set correctly from the factory.

GPS Check Sum

GPS Check Sum setting is used to enable or disable data string error checking. Normally set to ON.

Field Marker

If you are...	Select
Marking field points with the PF3000's internal marker selection keys.	INTERNAL
Marking field points with an external Ag Leader Field Marker.	EXTERNAL

* * *

Introduction

If you are using the GPS receiver, all the GPS data must be logged to a memory card. If you are not using a GPS receiver, you do not need a card. The memory card must be formatted with a DOS format. Cards rarely need to be formatted since they are usually DOS formatted before they are shipped. If formatting is required, format the card in your PC before using.

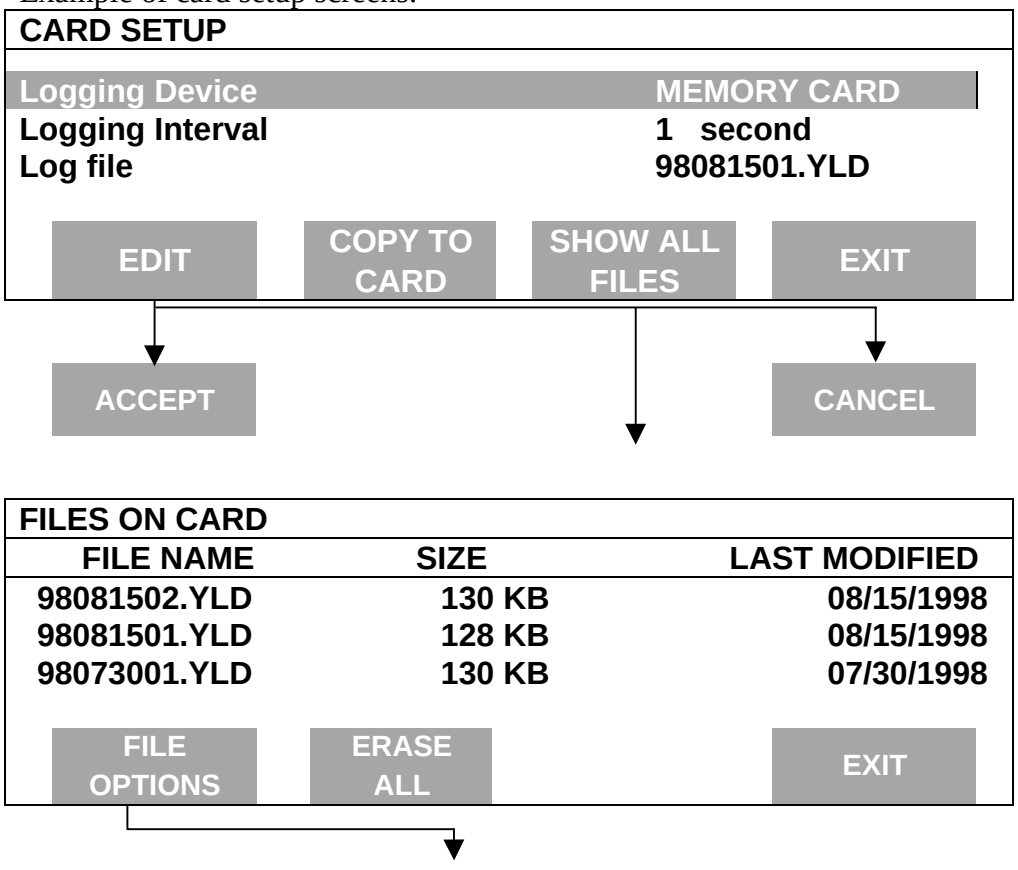
IMPORTANT:
You must copy memory to every log file you create and log to before you read the card into your computer.

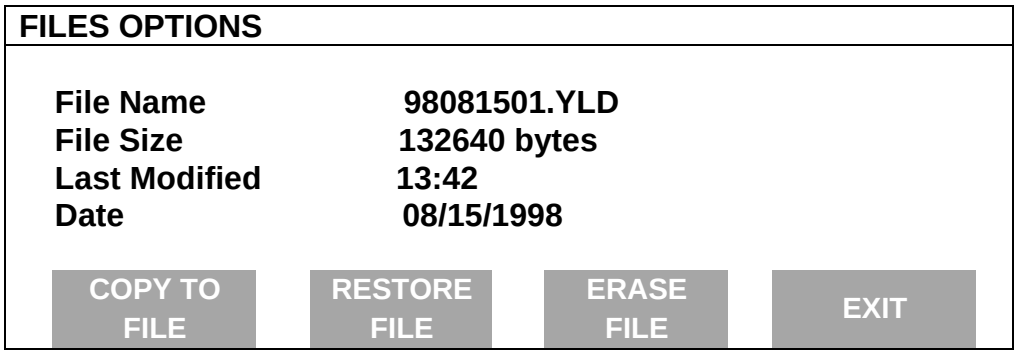
Card Setup Screen

To view the card setup screen press the:

MENU key 
SETUP key
CARD key

Example of card setup screens:





Changing a Setting

Step	Action
1	Use the UP or DOWN ARROW keys to select the item you want to change. The item is selected when a black filled rectangular box surrounds the entire line.
2	Press the EDIT key and then use the UP or DOWN ARROW keys to change the number or setting.
3	Once you have changed a setting press the ACCEPT key. Press the EXIT key once you have made all the settings.

Logging Device

If you are using the GPS receiver with the PF3000 you must use a memory card to save the instantaneous GPS data.

If you...	Select
Do not have a GPS receiver.	NONE
Do have a GPS receiver.	MEMORY CARD

NOTE: In Application Rate mode, if the PF3000 is controlling application rate, but you don't want to log actual rate to card set to NONE.

Logging Interval

This setting determines how often the GPS information is saved to the memory card. It also affects how large an area each GPS record will represent on a map and how many logging hours are available before the memory card becomes full.
There are three possible settings for the logging interval.
1, 2 or 3 Seconds. The recommended setting is either two or three seconds.

	Distance Traveled (ft)		
	1 sec	2 sec	3 sec
3 mph	4.4	8.8	13.2
5 mph	7.3	14.6	21.9

	Logging Hours Available/Logging Interval		
	1 sec	**2 sec**	**3 sec**
Ag Leader 32MB ATA Flash Card	400	800	1200

NOTE: The logging hours available can vary from the numbers shown above due to the number of separate files that can be stored on the card.

Log File

The PF3000 requires a log file to store data on a memory card. The log file will always have a ".yld" extension and be named with the date the file was created. *Example:* **98081502.yld,** second file created on 08/15/98.

IMPORTANT: You must copy memory to every log file you create and log to before you read the card into your computer. The monitor automatically copies data to the log file every time it is shut off.

Using the Ag Leader ATA FLASH card a new log file must be created for each day. You can not add to an old log file after a new file has been created but you can store multiple log files on one card.

In order to log instantaneous GPS data or copy field and load data to a memory card, a log file must be selected. Every time you turn on the monitor, the monitor will prompt you to select or create a log file. Refer to the steps below to select or create a log file after the monitor has been turned on.

Step	Action
1	Select Log File and press the EDIT key.
2	Select a log file or press CREATE FILE key to create a new log file.
3	With the desired file selected, press the ACCEPT key.

NOTE: After you read all the log files on your card into your computer (and make backup copies of files), it is recommended to erase the log file(s) on the card.

Copying Data to Log File

To copy memory to log files that are not set as the current log file, press the SHOW FILES key and select one of the log files. Press the FILE OPTIONS key and press the COPY TO FILE key. At the card setup screen, press the COPY TO CARD key to copy memory to the file set as the log file (this is the same copy to card function that automatically occurs when monitor is shut off).

Restoring from File

You can restore field and load data into the monitor's memory from a log file on a memory card.

IMPORTANT: It is dangerous to restore memory from a card because the current data in the monitor will be replaced with the data on card.

Step	Action
1	Press the SHOW ALL FILES key. Select the log file and press the FILE OPTIONS key. Press the RESTORE FILE key.
2	Press the RESTORE key again if you really want to restore the data.
3	Press the EXIT key once you are finished.

Erasing File

You can erase individual log files from a memory card

Step	Action
1	Press the SHOW ALL FILES key. Select the log file and press the FILE OPTIONS key. Press ERASE FILE key.
2	Press the ERASE key again if you really want to erase the file.
3	Press the EXIT key once you are finished.

* * *

Recommendations

NOTE: If using Application Rate Mode, refer to the Controller Setup instructions on how to create and change fields. Refer to this section for how to name fields and loads.

All the information recorded by the PF3000 must be recorded in a field and load. The field and load that the monitor is set on is located on the top line of the display on the main operating screen.

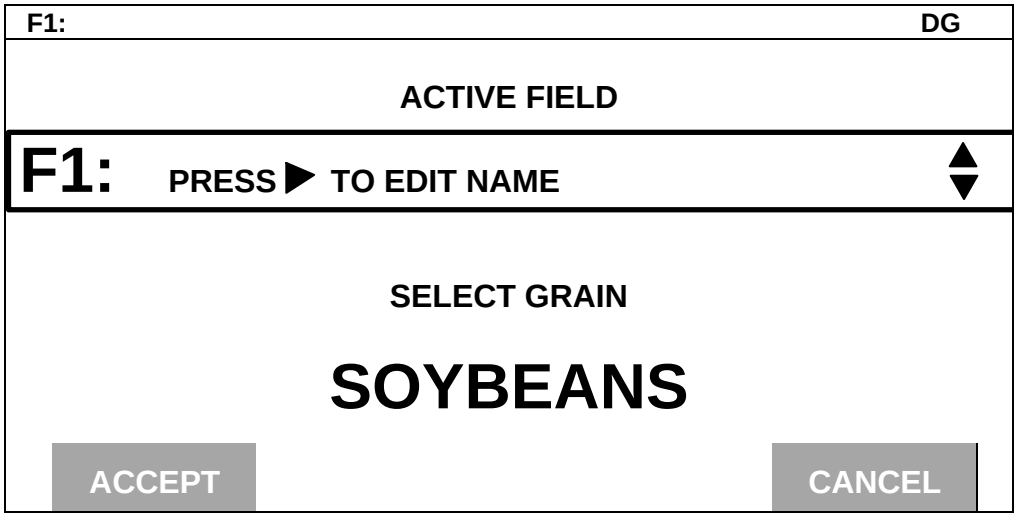
Fields
You should at least create all the fields and name them before you begin to use the PF3000. The monitor will use the same set of fields you create for each operating mode (harvest mode, application rate mode, site verification) of the monitor. You can create and name your fields using any operating mode. You should choose field names that you can use year after year.

Loads
It also recommended to create and name loads within fields before you use the PF3000. **Each operating mode of the PF3000 will have its own set of loads for each field.**

Definition:
Load: A load is used to subdivide a field into smaller sections. The monitor load is not associated with the combine tank, wagon, or truck load.

Creating and Naming Fields

Step	Action
1	Press the MENU key  until the following is displayed on the bottom of the display. FIELD LOAD SHOW MAP OPTIONS
2	Press the FIELD key twice to view the screen below.



Step	Action
3	**Naming Field** With the line displaying the field number selected (rectangular box surrounds line), press the RIGHT ARROW key to move the cursor to the right to enter a name. Use the UP or DOWN ARROW keys to scroll through letters, numbers and other characters. After you have set the character, move the cursor to the right by pressing the RIGHT ARROW key and set a new character. You can enter up to an 8-character name. Press the ACCEPT key once you have entered a name.
4	**Setting Grain (harvest mode) or Site Type (Site Verification Mode)** To set the grain or site type for the field you must select the line displaying the grain or site type. Press the key to the right of the line displaying the grain or sit type to select the line. Use the UP or DOWN ARROW keys to set the setting. Press the ACCEPT key twice, once to accept the grain or site type, once to accept the field.

Step	Action
5	**Creating Fields** Press the UP ARROW key to scroll through all the fields. Once you scroll past the last field, "Create New Field" will be displayed. Name the field and set the grain or site type, then with "Create New Field" displayed above the field number press the ACCEPT key to create the new field.
6	Repeat Step 5 and create and name all your fields.

NOTE: You can have more than one grain or site type in a field.

To enter more than one grain or site type, press the FIELD key twice so that the field is displayed in large text. Select the line displaying grain or site type and change the setting. Press the ACCEPT key twice, once to accept the new grain or site type and once to accept the field. The monitor will create a separate set of loads (which are renumbered beginning with load one) for each grain or site type in a field.

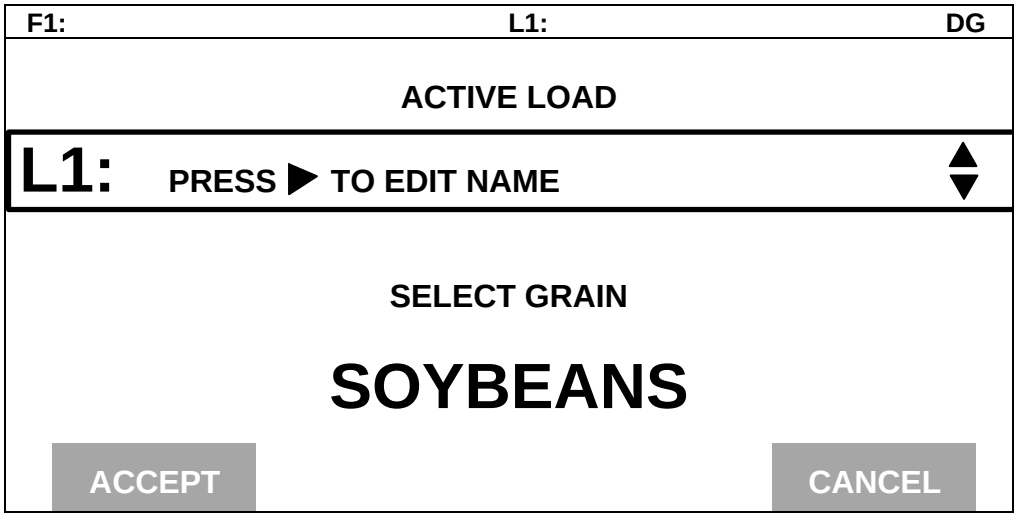
Example of load organization when two grain types are in one field in harvest mode:

Corn		Soybeans	
F10	L1	F10	L1
	L2		L2
	L3		L3

Grass Seed types	**Harvest grain types**	**Site Verification types**
ANNUAL RYE	SOYBEANS	PLANTING 1
PERENNIAL RYE	CORN	PLANTING 2
FESCUE	WHEAT	PLANTING 3
ORCHARD GRASS	OATS	SPRAYING 1
CRIMSON CLOVER	RYE	SPRAYING 2
MEADOW FOAM	BARLEY	SPRAYING 3
WHITE CLOVER	SORGHUM	FERTILIZER 1
BENT GRASS	POPCORN	FERTILIZER 2
	EDIBLE BEANS	FERTILIZER 3
	CORN 2	OPT SITE 1
	CANOLA	OPT SITE 2
	RICE	OPT SITE 3
	SUNFLOWERS	OPT SITE 4
	CORN 3	OPT SITE 5
	CORN 4	OPT SITE 6
	OPT GRAIN 1	OPT SITE 7

Creating and Naming Loads

Step	Action
1	Press the MENU key  until the following is displayed on the bottom of the display. FIELD LOAD SHOW MAP OPTIONS
2	Press the LOAD key twice to view the screen below.



Step	Action
3	**Naming Load** With the line displaying the load number selected (rectangular box surrounds line), press the RIGHT ARROW key to move the cursor to the right to enter a name. Use the UP or DOWN ARROW keys to scroll through letters, numbers and other characters. After you have set the character, move the cursor to the right by pressing the RIGHT ARROW key and set a new character. You can enter up to an 8-character name. Press the ACCEPT key once you have entered a name.

Step	Action
4	**Creating Loads** Press the UP ARROW key to scroll through all the loads in the field for the grain type. Once you scroll past the last load, "Create New Load" will be displayed above the load number and name. Name the load and set the grain type, then with "Create New Load" displayed above the load number press the ACCEPT key to create the new load.
5	Repeat step 4 and create and name all your loads.

Note: Refer to Load Setup to change grain, product or site type for an existing load.

Changing Fields and Loads

Changing Field
Press the FIELD key to display current field. Press the UP or DOWN ARROW keys to scroll through the fields. Press the ACCEPT key to change to the different field.

Changing Load
Press the LOAD key to display the current load. Press the UP or DOWN ARROW keys to scroll through the loads. Press the ACCEPT key to change to the different load.

* * *

Introduction

If you are using an external Field Marker ignore the instructions below. The marker setup screen is only used for making settings for the Internal marker selection keys.

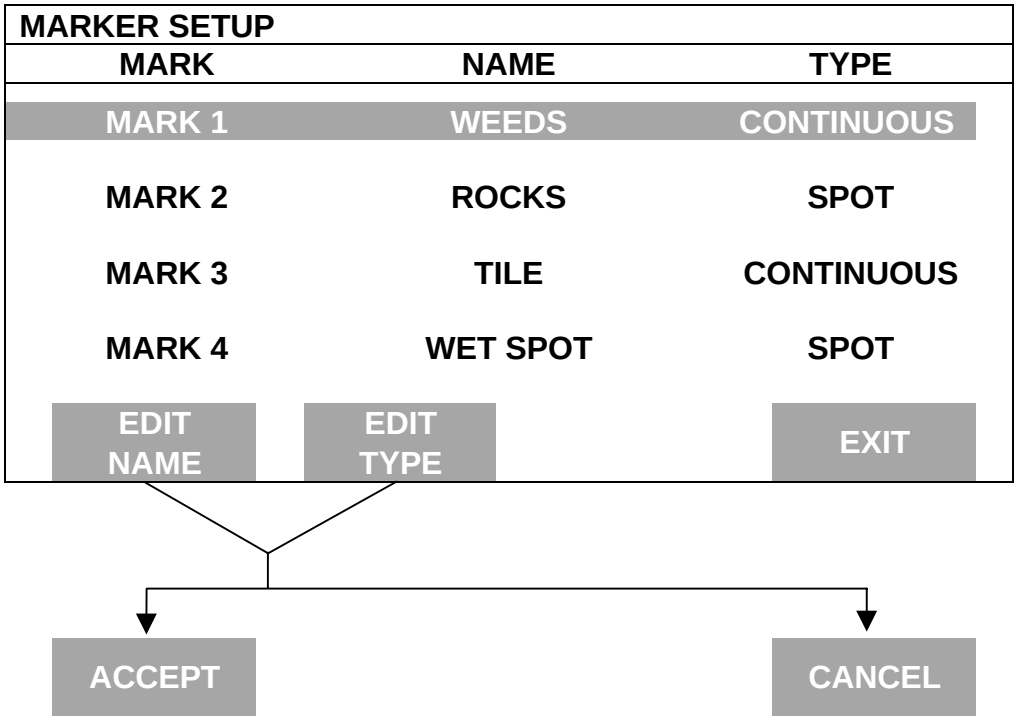
IMPORTANT:
If you are using the external field marker, make sure that under the CONSOLE key you set Field Marker to EXTERNAL.

Marker Setup Screen

To view the marker setup screen press the:

MENU key
SETUP key
OPTIONS key
MARKS key

Example of marker setup screen:



Changing a Setting

Step	Action
1	Use the UP or DOWN ARROW keys to select the mark. The mark is selected when a black filled rectangular box surrounds the entire line.
2	Press the EDIT NAME key to rename an existing mark. Use the UP or DOWN ARROW keys to change a character in the name. Use the LEFT or RIGHT ARROW keys to move the cursor over another character within the name. Press the ACCEPT key after you have changed the name.
3	Press the EDIT TYPE key to set the mark for continuous or spot marking. Use the UP or DOWN ARROW keys to change the setting. Press the ACCEPT key after you have changed the setting.
4	Press the EXIT key once you have made all the settings.

Continuous marking
Set the marking type to continuous if the item in the field you are marking requires you to make several marks in a row (for example: marking large weed patches or tile lines).

When you press a mark key that is set for continuous marking, the mark will remain on until you press the mark key again to turn off the mark.

Spot marking
Set the marking type to spot if the item in the field you are marking requires just one mark (for example: marking a rock or tile hole).

When you press a mark key that is set for spot marking, the mark will remain on only for a few seconds and then will automatically go off.

*** * ***

Introduction

The GPS 4100 or integrated GPS of the PF3000 require no initial setup to begin fieldwork. The PF3000 will display a "D" or "G" on the top right hand corner of the display to indicate a GPS signal. A "D" indicates that you have a differential signal. A "G" indicates that you have a GPS signal and you GPS receiver are tracking four or more satellites. A lower case "g" indicates that you have a GPS signal but your GPS receiver is tracking only three satellites. Your GPS receiver must track four or more satellites to get an elevation reading. You may wish to use the GPS to show your ground speed, which requires changing the ground speed sensor settings. Refer to Primary and Secondary Speed Sensor under Vehicle Setup in the PF3000 Operator's manual for instructions.

The following provides information to change factory settings on the integrated GPS:

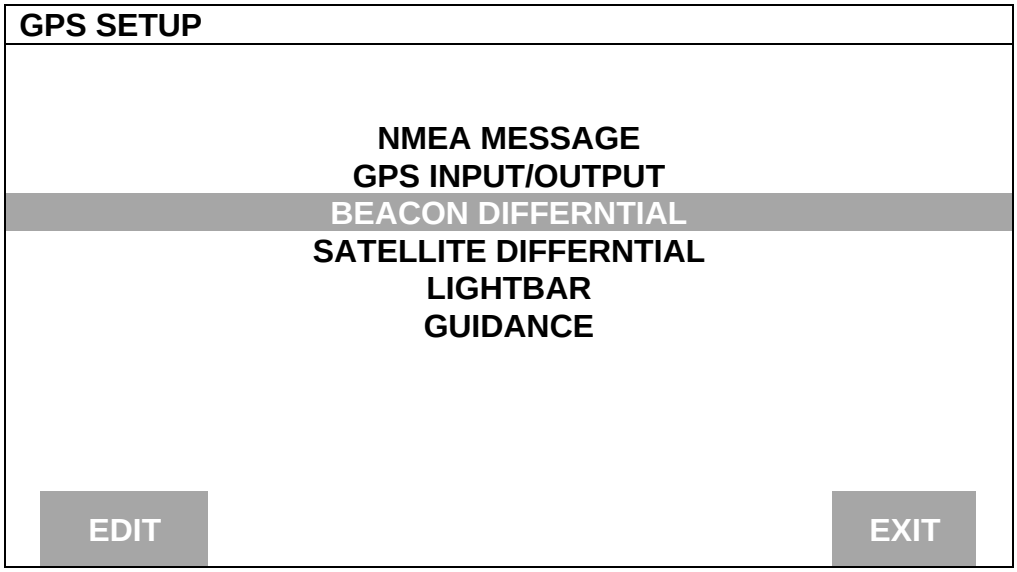
Beacon Selection

The settings for beacon selection are Auto range, Auto Power and Manual.

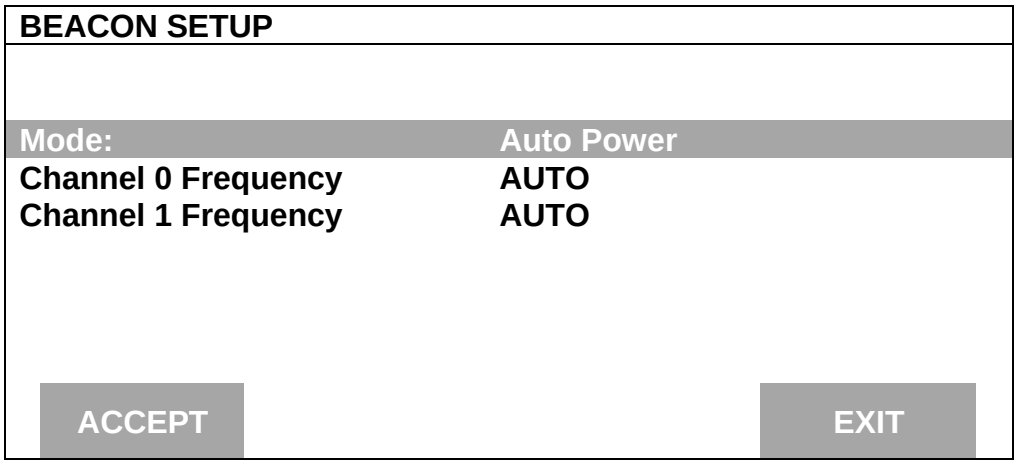
- Auto Range: This is the default setting. In this setting the receiver keeps a record of the closest three beacons within the receivers range. It then selects a beacon based on the ranking of the beacon in memory.
- Auto Power: The receiver keeps a record of the three strongest beacons in its range. It then selects a beacon based on the ranking of the available beacons.
- Manual: Allows you to input frequencies for two beacons.

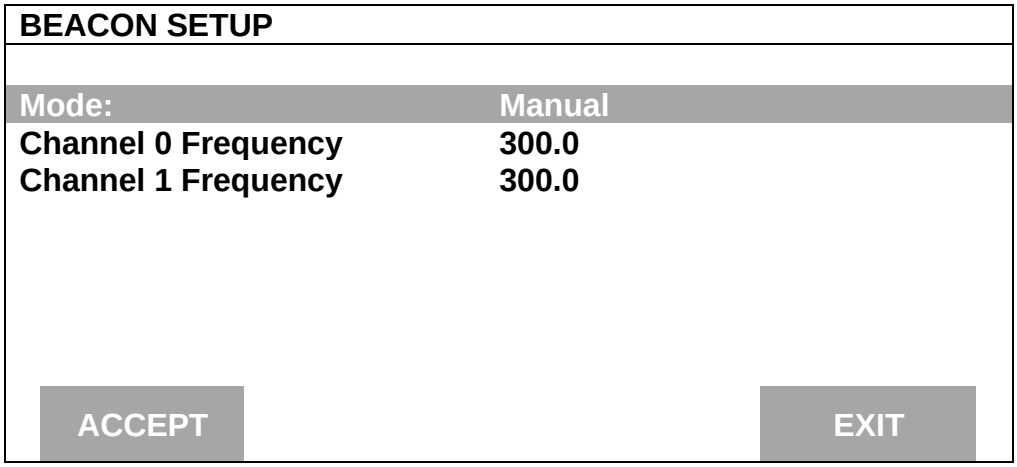
To change Beacon Selection complete the following steps:

Step	Action
1	Press Menu key on PF3000 until SETUP is displayed and press SETUP.
2	Press bottom left or right arrow key until GPS is displayed and press GPS key.



Step	Action
3	From the GPS SETUP screen scroll down to BEACON DIFFERNTIAL and press EDIT key. Use up or down arrow keys to set mode.
4	After setting Auto Power mode, push ACCEPT key and then EXIT.



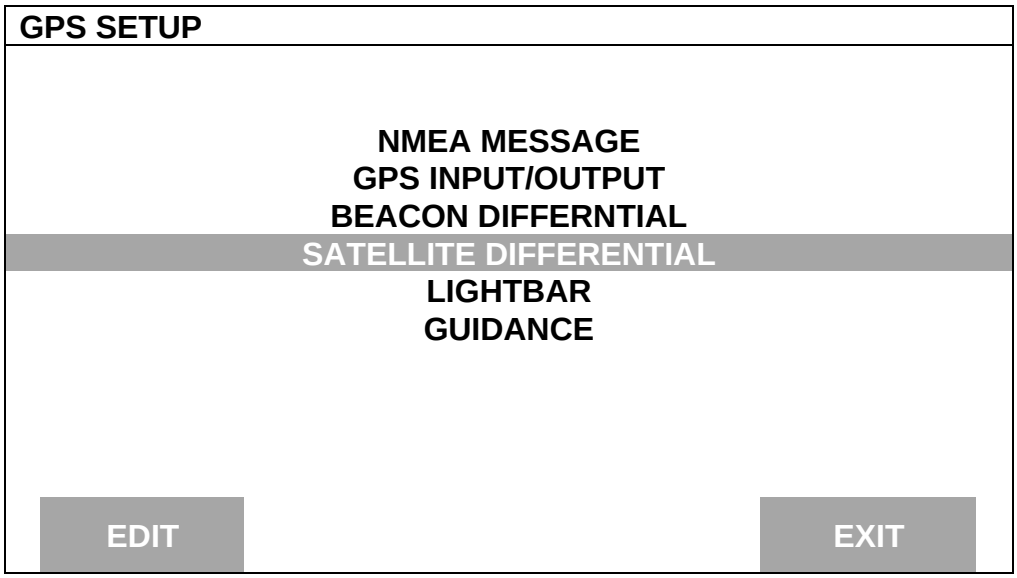


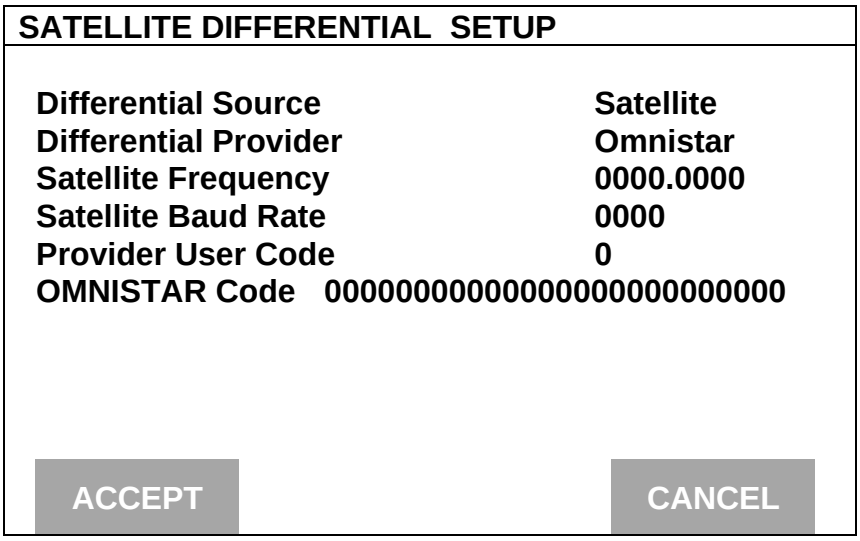
Step	Action
5	If you are setting to Manual push ACCEPT key then use down arrow key to scroll to Channel 0 Frequency and press EDIT key. Use the up or down arrow key to set desired frequency and press ACCEPT key. Scroll down to Channel 1 Frequency and press EDIT key. Use up or down arrow keys to set desired frequency and press ACCEPT key.
6	Press the EXIT key two times to return to operating screen.

Satellite Selection

If you will be using the satellite differential option then do the following depending on which service provider you select.

Step	Action
1	Press Menu key on PF3000 until SETUP is displayed, press SETUP key.
2	Press bottom left or right arrow key until GPS is displayed and press GPS key.
3	At the GPS SETUP screen scroll down to Satellite Differential with down arrow key and press EDIT.

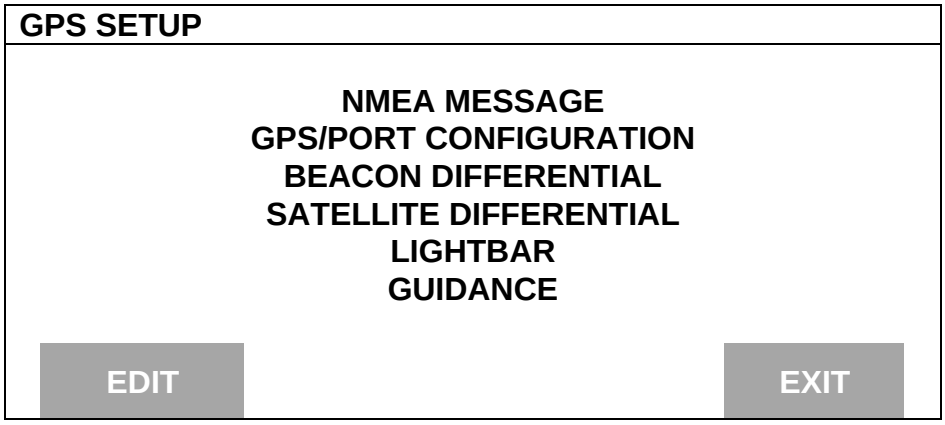




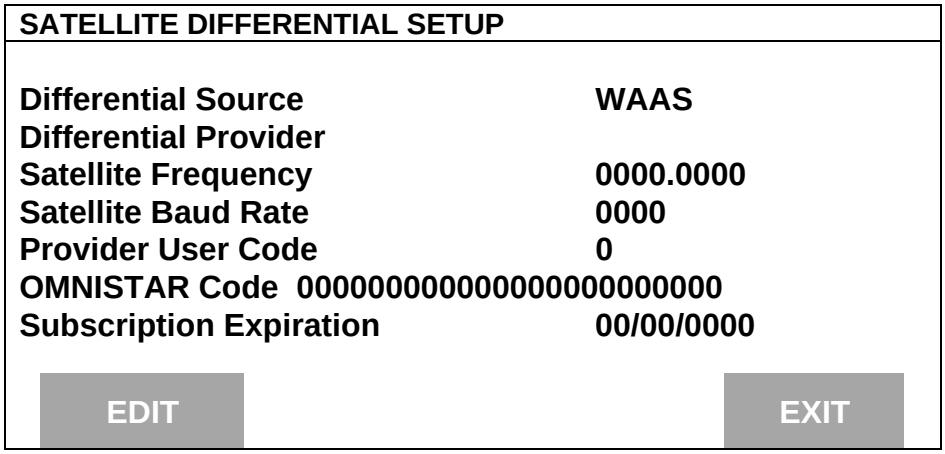
WAAS Selection

If you are going to use the WAAS option complete the following:

Step	Action
1	Press Menu key on PF3000 until SETUP is displayed, press SETUP key.
2	Press bottom left or right arrow key until GPS is displayed and press GPS key. You should now see the screen shown below.



Step	Action
3	At the GPS SETUP screen scroll down to Satellite Differential Mode with down arrow key and press EDIT. You should now see the screen shown below.



Step	Action
4	At the SATELLITE DIFFERENTIAL SETUP screen Differential Source will be highlighted, press EDIT key and use UP or DOWN ARROW key until WAAS is displayed and press ACCEPT key.
5	Now press EXIT key to return to GPS SETUP screen, press EXIT key again to return to the main operating screen.

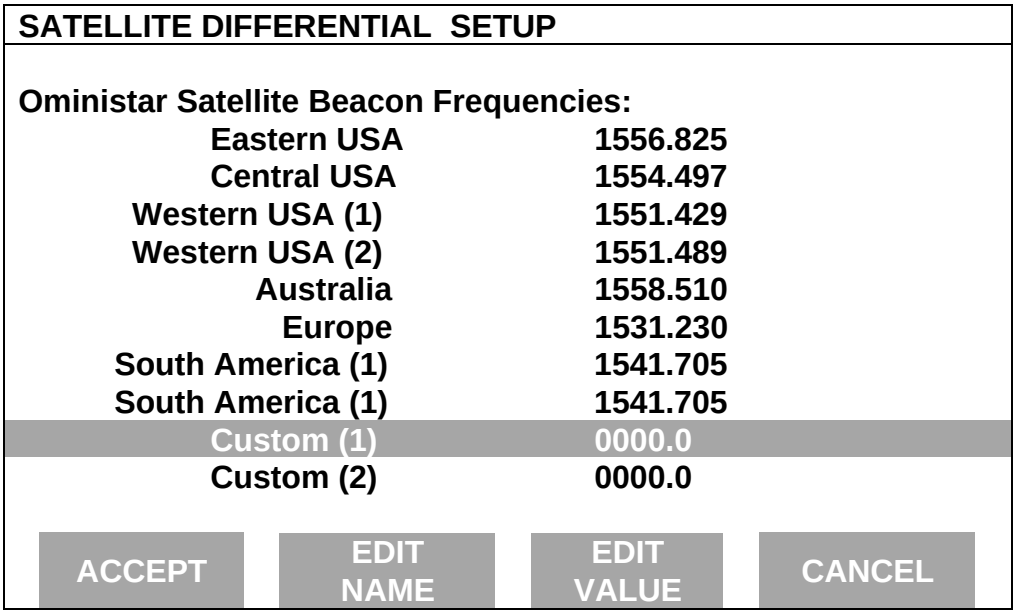
If you will be using…	Then…
Omnistar	At SATELLITE DIFFERENTIAL SETUP screen Differential Source will be highlighted, press EDIT key and use up or down arrow key until Satellite is displayed and press ACCEPT key. Scroll down to Differential Provider and press EDIT key. Use the UP or DOWN ARROW key until Omnistar is displayed and press ACCEPT key. Scroll down to Satellite Frequency and press EDIT key. Use the UP or DOWN ARROW key to select your region and press ACCEPT key. If you will be using a custom frequency with this provider, scroll down to Custom (1) and push EDIT NAME key. Use the UP or DOWN and LEFT or RIGHT ARROW keys to name this frequency. Push EDIT VALUE key and use the UP or DOWN and LEFT or RIGHT ARROW keys to enter the frequency. Push ACCEPT key. Your customized frequency should appear as the Satellite Frequency.

SATELLITE DIFFERENTIAL SETUP

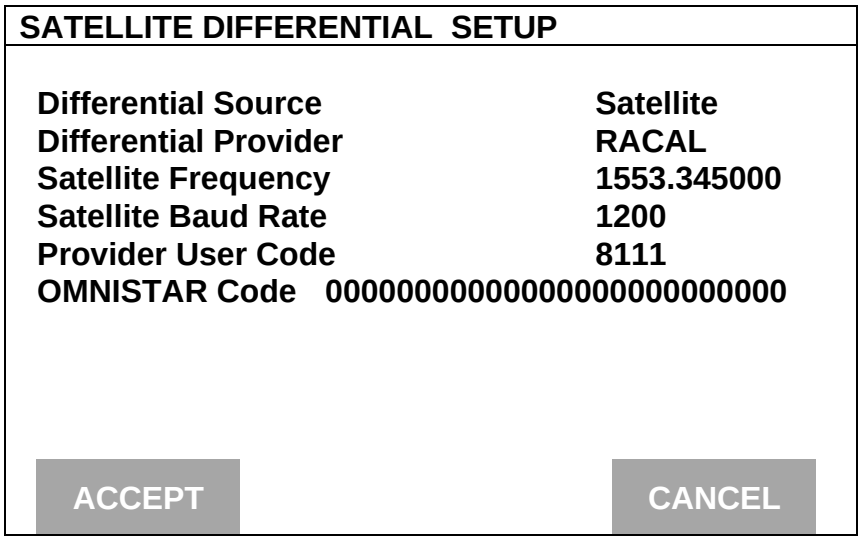
Ominstar Satellite Beacon Frequencies:

Eastern USA	**1556.825**
Central USA	**1554.497**
Western USA (1)	**1551.429**
Western USA (2)	**1551.489**
Australia	**1558.510**
Europe	**1531.230**
South America (1)	**1541.705**
South America (2)	**1541.715**
Custom (1)	**0000.0**
Custom (2)	**0000.0**

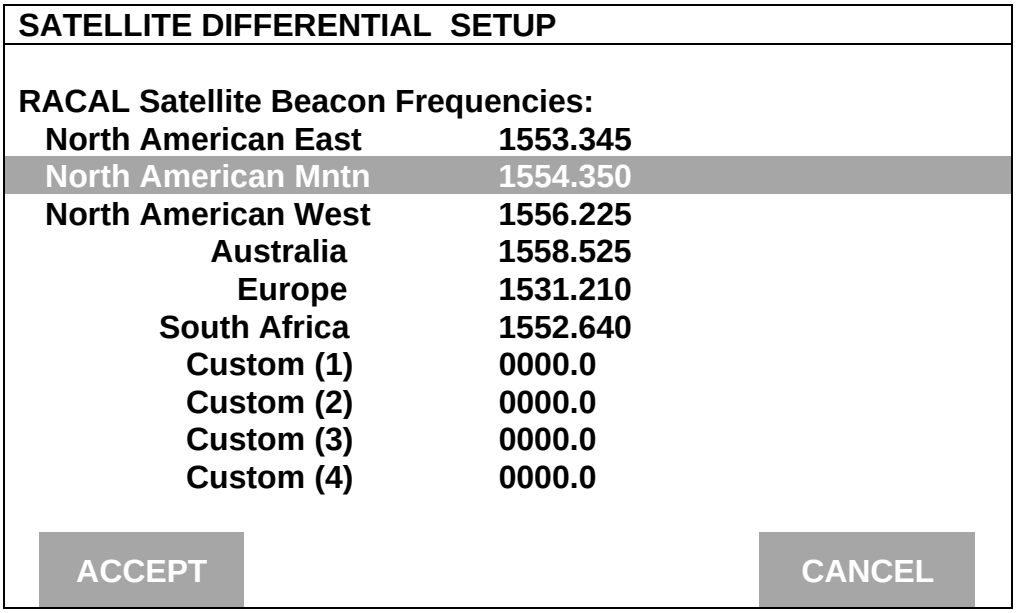
ACCEPT **CANCEL**

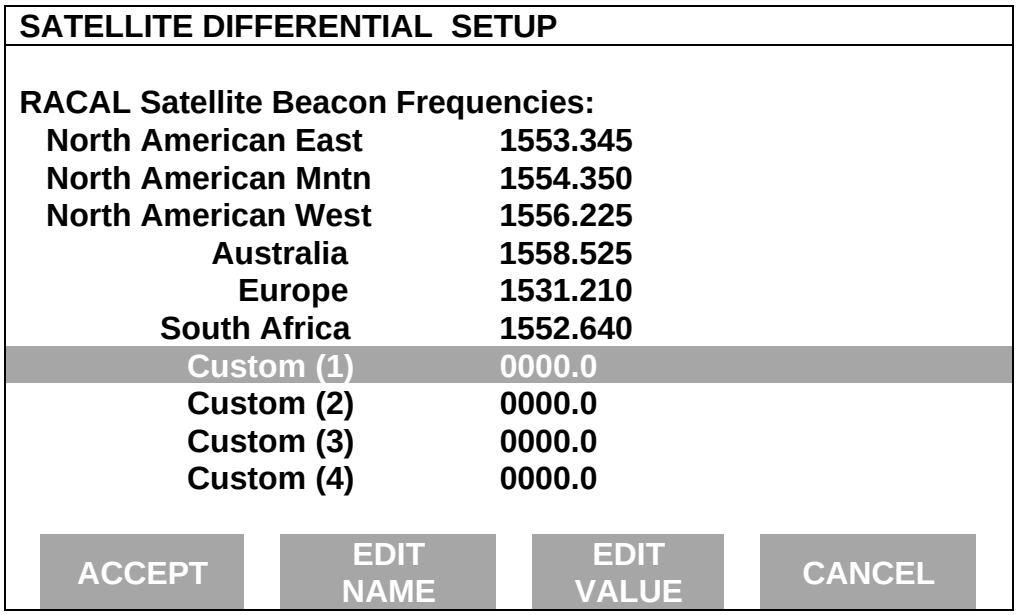


If you will be using…	Then…
Omnistar	Call the Omnistar subscription number (713-785-5850 in the USA) and give them the number to the right of the GPS serial number. Omnistar will then give you a 24-digit code. Key the code into the right of Omnistar Code using UP and DOWN ARROW keys. Once the code is entered, press ACCEPT key to send the code to the unit. Now press EXIT key to return to GPS SETUP screen, press EXIT key to return to operating screen. After 30 minutes, the receiver should start receiving corrections and display a "D" in the upper right hand corner of the PF3000.

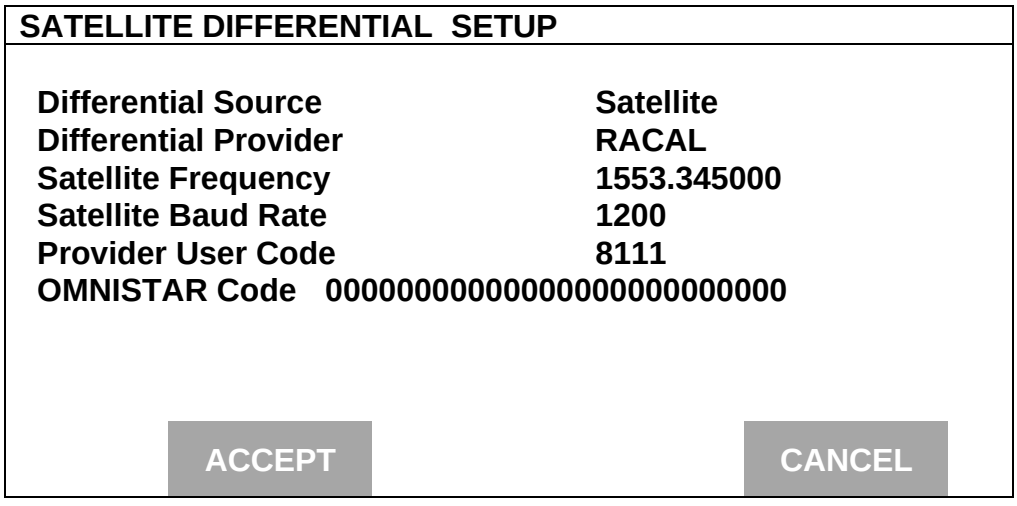

SATELLITE DIFFERENTIAL SETUP
Differential Source
Satellite
Differential Provider
RACAL
Satellite Frequency
1553.345000
Satellite Baud Rate
1200
Provider User Code
8111
OMNISTAR Code
00000000000000000000000000
ACCEPT
CANCEL

If you will be using …	Then…
RACAL	At SATELLITE DIFFERENTIAL SETUP screen Differential Source will be highlighted press EDIT key and use UP or DOWN ARROW key until Satellite is displayed and press ACCEPT key. Scroll down to Differential Provider and press EDIT key. Use the UP or DOWN ARROW key until RACAL is displayed and press ACCEPT key. Scroll down to Satellite Frequency and press EDIT key. Use the UP or DOWN ARROW key to select your region and press ACCEPT key. If you will be using a custom frequency with this provider, scroll down to Custom (1) and push EDIT NAME key. Use the UP or DOWN and LEFT or RIGHT ARROW keys to name this frequency. Push EDIT VALUE key and use the UP or DOWN and LEFT or RIGHT ARROW keys to enter the frequency. Push ACCEPT key. Your customized frequency should appear as the Satellite Frequency.





If you will be using …	Then…
RACAL	Call the RACAL subscription number (713-784-4482 in the USA) and give them the number to the right of the GPS serial number. RACAL will activate a code for the serial number that was given. After the serial number is called in, press the EXIT key to return to operating screen. Within 15 to 30 minutes the receiver should start receiving corrections from RACAL. A "D" should appear in the upper right hand corner of the PF3000.



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Introduction

For each operating mode, there are different items to setup in the vehicle setting screen. Below are the setup items for the harvest mode. Refer to your *Initial Calibration Sheet* to make the correct settings.

Vehicle Setup Screen

To view the vehicle setup screen press the:

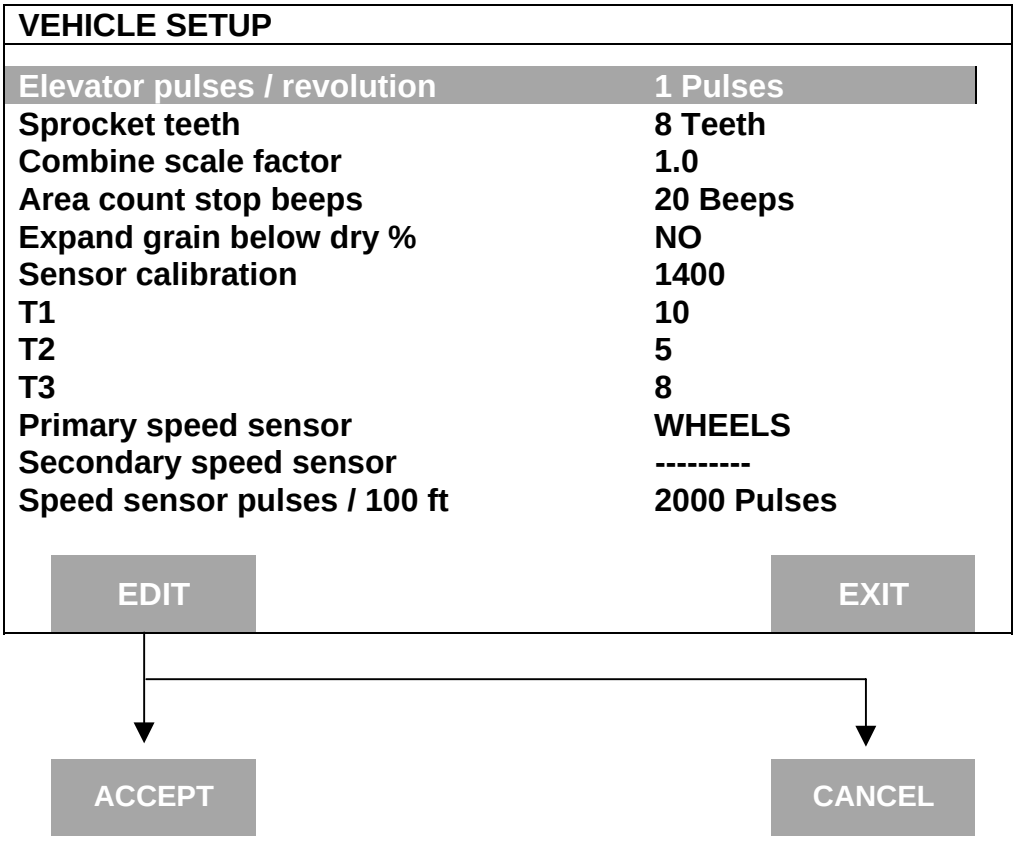
MENU key 

SETUP key

bottom RIGHT ARROW key

VEHICLE key

Example of vehicle setup screen:



Changing a Setting

Step	Action
1	Use the UP or DOWN ARROW keys to select the item you want to change. The item is selected when a black filled rectangular box surrounds the entire line.
2	Press the EDIT key and then use the UP or DOWN ARROW keys to change the number or setting.
3	Once you have changed a setting press the ACCEPT key. Press the EXIT key once you have made all the settings.

Elevator pulses/revolution

Refer to the *Initial Calibration Sheet* for the correct setting for your combine.

Sprocket teeth

Refer to the *Initial Calibration Sheet* for the correct setting for your combine.

Combine scale factor

Refer to the *Initial Calibration Sheet* for the correct setting for your combine.

IMPORTANT:

- **Never change the scale factor during harvest. Doing so will cause the monitor to lose calibration accuracy and you will have to set the monitor on different grain types and recalibrate every grain type.**

- **All of your calibration loads and data loads must be harvested using the same scale factor setting otherwise you will have severe calibration problems that possibly can not be corrected.**

Area count stop beeps

This setting is for the number of times the monitor beeps when the head is raised at the end of a pass and the monitor stops counting area.

NOTE: The recommended setting is 20. Set this number high enough so that after the head is raised at the end of a pass, the beeps continue until the combine is completely turned around and the head is lowered to start the new pass. This gives the operator an audible signal that the head is lowered enough to begin counting area again.

Expand grain below Dry %

If you select . . .	Then . . .
No,	You prevent the monitor from adding bushels to grain that is dryer than the dry percent moisture by which dry bushels are calculated. This calculates all yields in terms of actual bushels available for you to sell. (Recommended setting).
Yes,	The monitor shows a yield comparison of all loads at the dry percent moisture. This increases the bushels of the grain harvested below the dry percent moisture to account for moisture lost because of excessive dryness of the grain.

NOTE: This setting applies to all loads and grains in the monitor. It can be changed from NO to YES and vice-versa at any time.

Sensor calibration

Refer to the *Initial Calibration Sheet* for the correct setting for your combine.

NOTE: If you replace the flow sensor, you must change this setting to the value of the new sensor calibration number of the new flow sensor.

T1, T2, T3

Refer to the *Initial Calibration Sheet* for the correct setting for your combine.

Primary and Secondary speed sensor

The monitor has four different primary speed settings. They are listed below.

Ground Speed Sensor	Primary Speed Sensor
Speed sensor on transmission	WHEEL
Speed sensor on tracks	TRACK
Radar gun	RADAR
GPS receiver	GPS

If you choose GPS as your primary speed sensor, you need to set the secondary speed sensor to WHEEL, TRACK, or RADAR. If the GPS signal is lost, the monitor will use the secondary speed sensor. If you do not choose GPS as your primary speed sensor you can not set the secondary speed sensor.

Speed sensor pulses / 100 ft.

It is not recommended that you change this setting. This number is the distance calibration number that is set when you perform a distance calibration for WHEEL, TRACK or RADAR. Refer to the calibrating distance instructions in the Calibration section. You must calibrate distance for a WHEEL, TRACK or RADAR setting for accurate ground speed.

*NOTE: If you want to use a radar gun, contact an **Ag Leader Technology** dealer and purchase a special adapter cable for your radar gun.*

* * *

Grain Setup

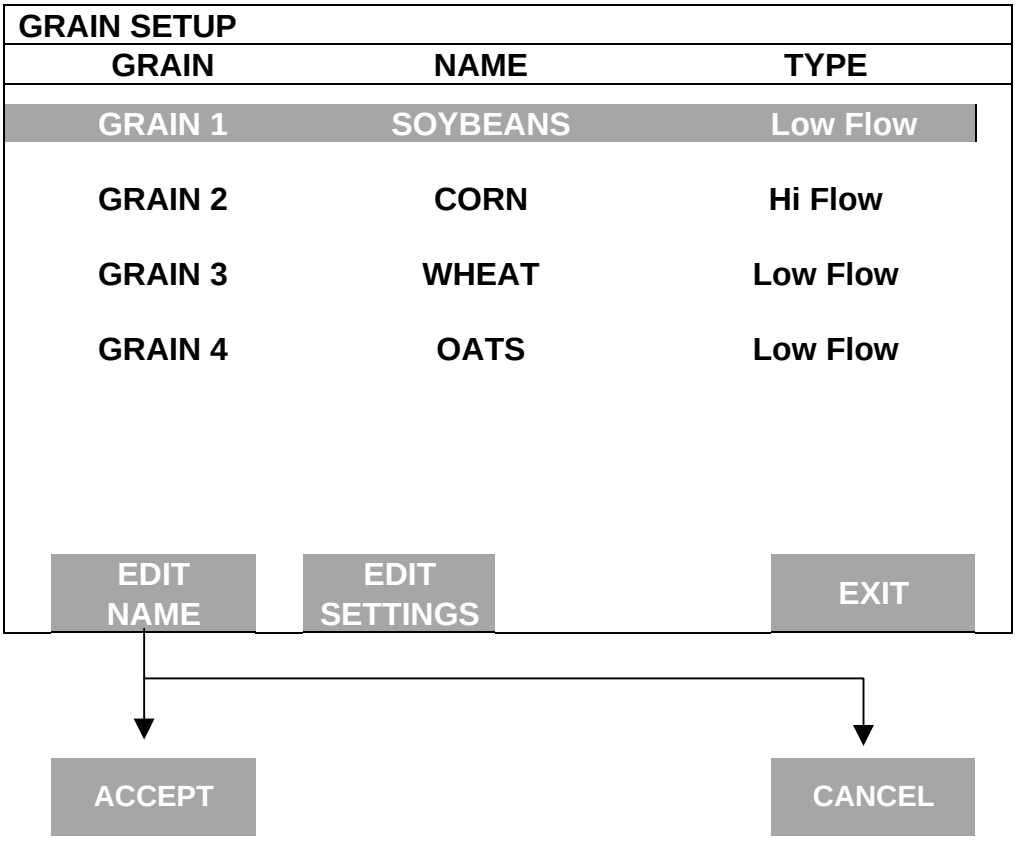
NOTE: Grass Seed monitors are setup using the same procedures as Grain.

Screen

To view the grain setup screen press the:

MENU key 
SETUP key
GRAIN key

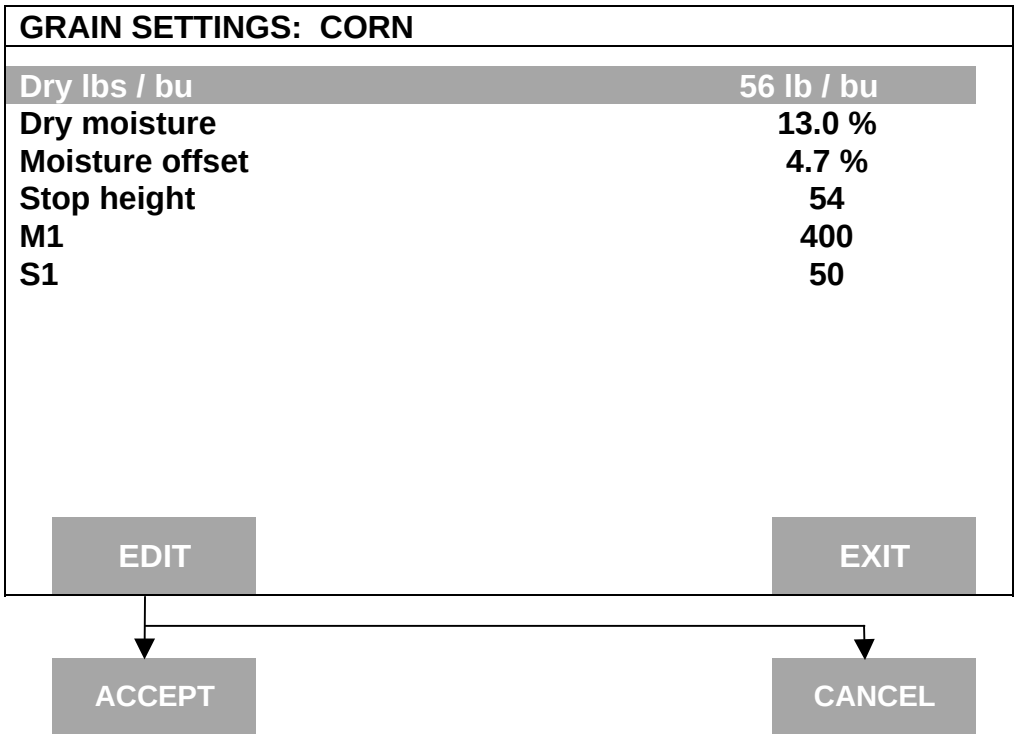
Example of grain setup screen:



Changing a Setting

Step	Action
1	Use the UP or DOWN ARROW keys to select the grain. The grain is selected when a black filled rectangular box surrounds the entire line.
2	Press the EDIT SETTINGS key to move to another screen and change the settings for the selected grain. Refer to the screen below.
3	Press the EDIT NAME key to rename an existing grain (can not rename SOYBEANS, CORN, or WHEAT). Use the UP or DOWN ARROW keys to change a character in the name. Use the LEFT or RIGHT ARROW keys to move the cursor over another character within the name. Once you have changed the grain name press the ACCEPT key.
4	Press the EXIT key once you have made all the settings.

Example of grain settings screen:



Dry lbs / bu	This setting is the pounds / bushel value that the monitor uses to calculate bushels. You can change this setting for all grains except corn (56 lbs / bu), soybeans (60 lbs / bu) and wheat (60 lbs / bu).
Dry moisture	This setting is the moisture value that the monitor uses to calculate dry bushels. Example: Corn – 15% Soybeans – 13%
Scale Factor	For grass seed the recommended setting is 1. Settings are 1, 10, 100.
Moisture offset	Refer to the *Initial Calibration Sheet* for the correct setting. Do not readjust the moisture offset number after you have performed a moisture calibration.
Stop Height	This setting determines how high the combine head must be raised to make the monitor stop counting area. This number can be automatically set under the CAL, STOP HGT key.
M1	Refer to the *Initial Calibration Sheet* for the correct setting.
S1	Refer to the *Initial Calibration Sheet* for the correct setting.

Setting Initial C Numbers

The 11 C Numbers, C1 through C11 determine the pounds of grain that the monitor calculates. The C numbers **initially** should be set to the same values that appear on your *Initial Calibration Sheet*, but they will change and become more accurate after you have calibrated.

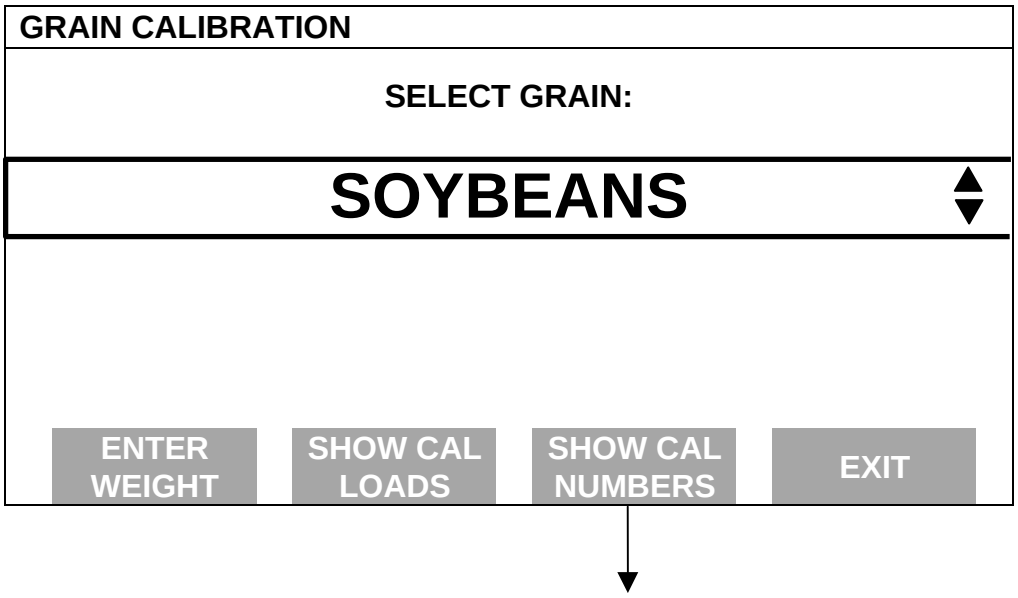
Do not change the C numbers after you have calibrated.

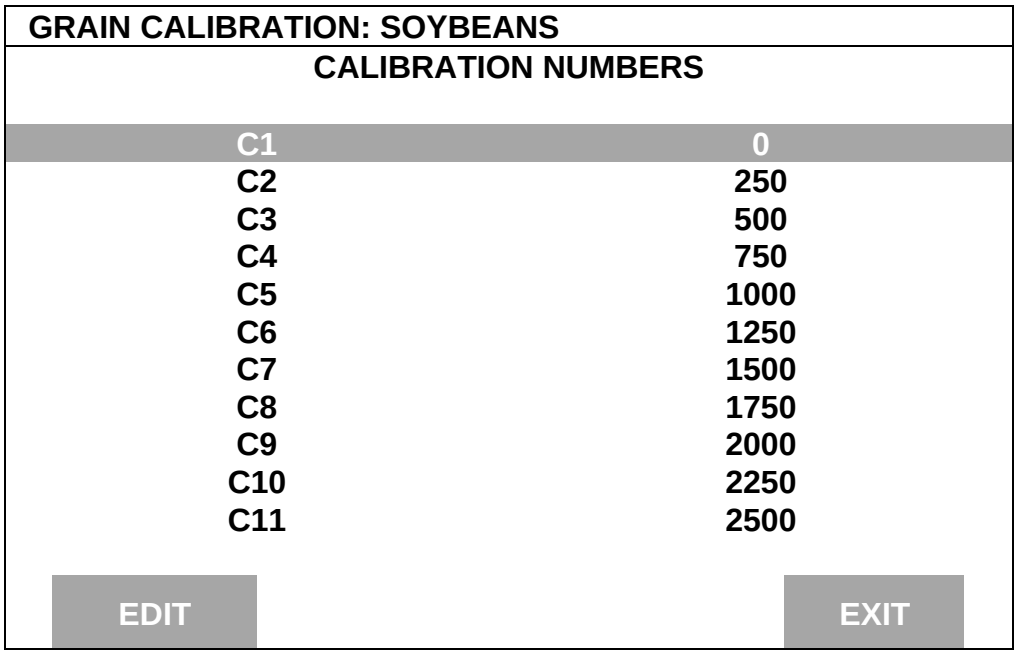
You only need to set the C11 number to its initial value. When you set the C11 number, the C2-C10 numbers will automatically change to the correct value. Do not set the C1 number. It is adjusted automatically when you do a vibration calibration.

Changing C11

Step	Action
1	You must display the weight calibration screen. Press the following keys to view the weight calibration screen: MENU key  CAL key WEIGHT key
2	Refer to the screens on the next page and press the UP or DOWN ARROW keys to set a grain type that you will harvest. Press the SHOW CAL NUMBERS key.
3	Use the DOWN ARROW key to select C11 number (a line is selected when the entire line is surrounded by a black filled box).
4	Press the EDIT key. Use the UP or DOWN ARROW keys to set the correct number according to the *Initial Calibration Sheet*. Press the ACCEPT key.
5	Press the EXIT key once to return to the previous screen. Repeat steps 2-4 and set C11 for all the grain types you will harvest.
6	Press the EXIT key twice to return to the main operating screen.

*NOTE: You may not be able to set C11 to the exact number that is on the **Initial Calibration Sheet**. C2-C10 numbers also may not exactly agree with the **Initial Calibration Sheet**. If this is the case, set C11 as close to the initial number as possible.*


GRAIN CALIBRATION
SELECT GRAIN:
SOYBEANS
ENTER WEIGHT
SHOW CAL LOADS
SHOW CAL NUMBERS
EXIT


GRAIN CALIBRATION: SOYBEANS
CALIBRATION NUMBERS
C1 0
C2 250
C3 500
C4 750
C5 1000
C6 1250
C7 1500
C8 1750
C9 2000
C10 2250
C11 2500
EDIT
EXIT


ACCEPT
CANCEL

* * *

Introduction

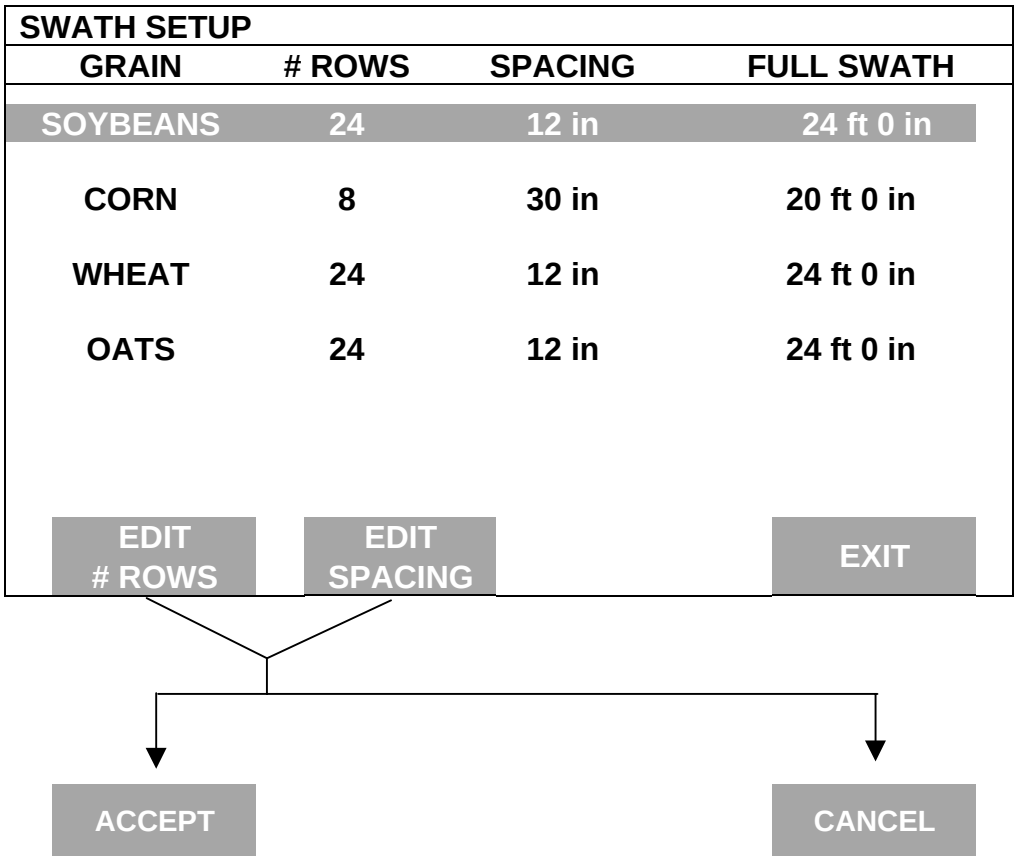
The swath setup screen is used to set the permanent, full swath of your head. Do not adjust the swath setting on this screen when you encounter a partial swath while harvesting. Refer to the Swath Setting instructions in Operation Section and select swath as a display item and set a partial swath.

Swath Setup Screen

To view the swath setup screen press the:

MENU key
SETUP key
SWATH key

Example of swath setup screen:



Changing a Setting

Step	Action
1	Use the UP or DOWN ARROW keys to select the grain. The grain is selected when a black filled rectangular box surrounds the entire line.
2	Press the EDIT # ROWS key to change the number of rows. Use the UP or DOWN ARROW keys to change the number. Press the ACCEPT key after you have changed the number.
3	Press the EDIT SPACING key to change the row spacing. Use the UP or DOWN ARROW keys to change the number. Press the ACCEPT key after you have changed the number.
4	Press the EXIT key once you have made all the settings.

Recommendations for Row Crop Heads:

- For row crops, set your row space to the planted row spacing and your number of rows to the number of total rows of your combine head.

Recommendations for Cutting Platform Heads:

Row Crops

- For row crops, set your row space to the planted row spacing and your number of rows to the number of total rows your cutting platform will cut.

Non-rowed crops

- Set the swath in the monitor to one foot less than the actual swath width of the head because you can rarely maintain a constant full swath while harvesting.

  Example: If your cutting platform head is 20 actual feet, set the monitor's swath to 19 feet by setting the row space to 12 inches and the number of rows to 19.

- Set the monitor on a row space of 12 inches and a number of rows that adds up to the correct swath. Setting the row space to 12 inches for cutting platforms allows you to reduce the cutting swath by easier-to-see one-foot increments when you are harvesting a partial swath

Refer to the Swath Setting instructions in the Operation Section for more information about partial swath.

* * *

Introduction

The swath setup screen is used to set the permanent, full swath of your application equipment. Do not adjust the swath setting on this screen when you encounter a partial swath in the field. Refer to the Swath Setting instructions in Operation Section and select swath as a display item and set a partial swath.

NOTE: If you do not want to count area, you do not need to set the swath.

Swath Setup Screen

Refer to the swath setup instructions for harvest mode for instructions on viewing the swath setup screen and setting the swath.

Recommendations

To enter a swath setting, you must enter a number of rows setting and a row spacing setting for the product you are applying.

Application equipment that uses row units
If your application equipment is applying the product with row units, then enter the number of rows and row spacing of the application equipment.

Application equipment that uses boom sections
If your application equipment is applying the product using boom sections enter the width of the boom section in inches for the row spacing setting. Enter the total number of booms for the number of rows setting. If your boom sections are not all the same width, enter twelve inches for the row spacing setting and a number rows setting that makes the total swath equal the full swath of the application equipment.

Application equipment that uses a spreader mechanism
If your application equipment is applying the product using a spreading mechanism enter twelve inches for the row spacing setting and a number rows setting that makes the total swath equal the full swath of the application equipment.

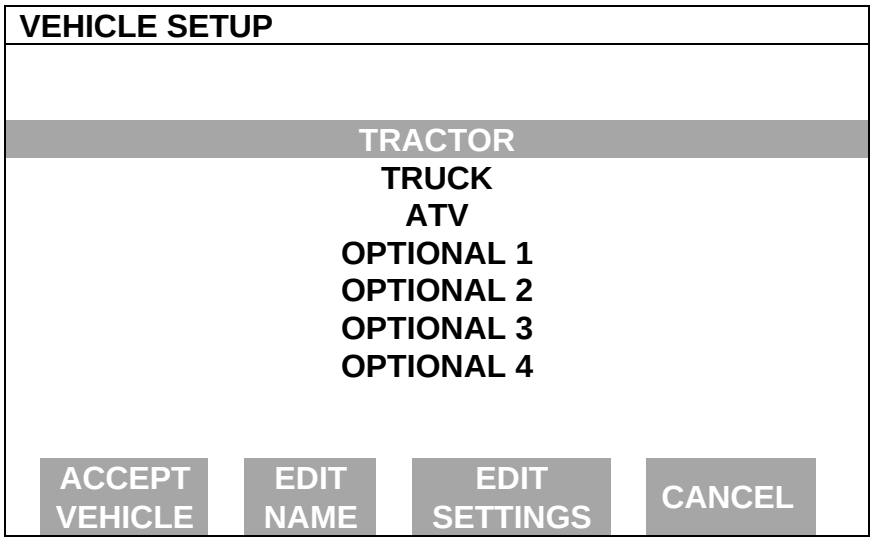
* * *

Introduction

For each operating mode, there are different items to setup in the vehicle setting screen. Below are the setup items for the site verification mode.

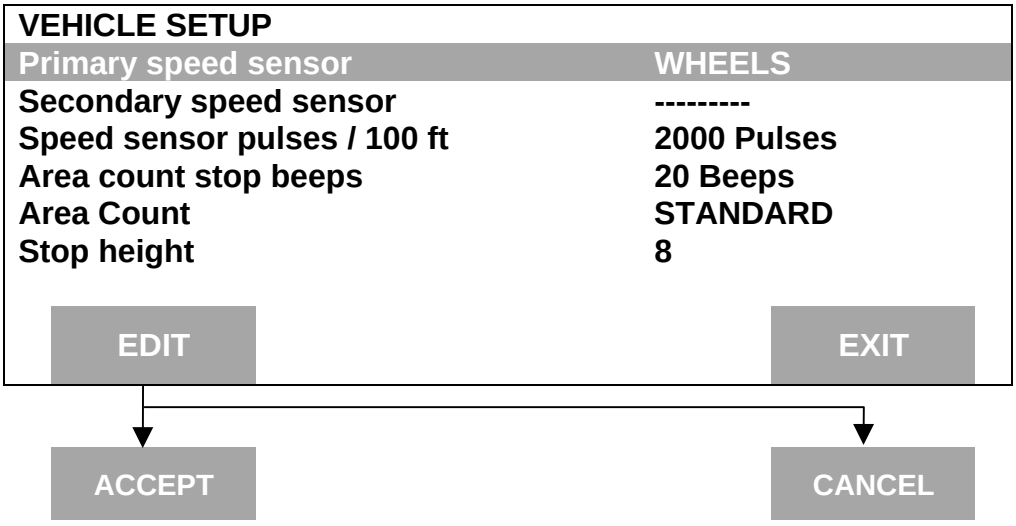
Vehicle Setup Screen

To view the vehicle setup screen, press the MENU key, SETUP key and VEHICLE key to view the following:



Use the UP or DOWN ARROW key select a vehicle type. Press EDIT NAME key. Use the UP or DOWN ARROW key to name the vehicle type and press SAVE NAME key.

To edit vehicle settings press EDIT SETTINGS key to view the following:



Press the UP or DOWN ARROW key to scroll down to highlight a setting and press the EDIT key to change a setting, then press ACCEPT key. After making changes, press EXIT key.

Choose the vehicle you want to use and press ACCEPT VEHICLE key.

Area count stop beeps

This setting is for the number of times the monitor beeps when the monitor stops counting area at the end of a pass.

Primary and Secondary speed sensor

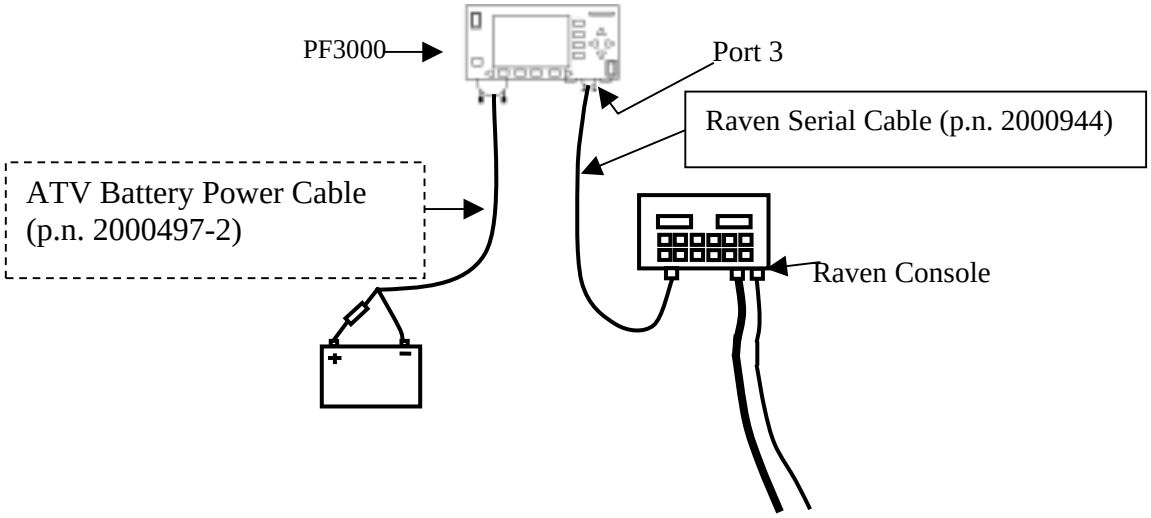
The monitor has four different primary speed settings. They are listed below.

Ground Speed Sensor	Primary Speed Sensor
Speed sensor on transmission	WHEEL
Speed sensor on tracks	TRACK
Radar gun	RADAR
GPS receiver	GPS

***

Cable attachment for Raven controllers <u>with</u> serial ports

NOTE: If your Raven console has a serial port, it will be on the back of the console. It is a nine-pin rectangular computer port. The Raven 750 and 760 serial port is built-in the main wiring harness. Not all Ravens consoles have a serial port.



Cable attachment from Raven console to monitor

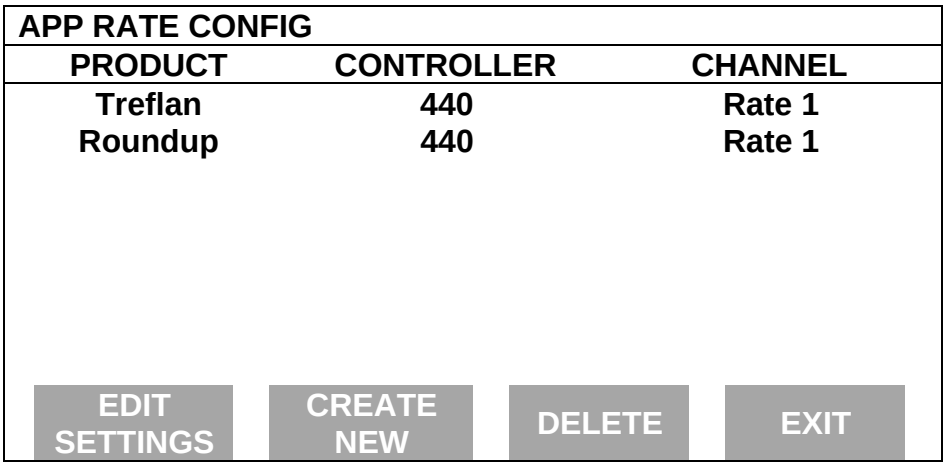
The Raven Serial Cable enables the PF3000 to control the rate. It also provides swath width (based on the number of booms on), actual rate and area count status (based on Master Switch) information to the PF.

Setup for Raven controllers <u>with</u> serial ports

Complete the following steps to set up for Raven – Sidekick, 440, 450, 460, 660, 700, 710, 750, 760 controllers <u>with</u> serial ports.

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for a Raven 440.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear.



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to RAVEN. This setting can not be changed once the configuration is used by one or more fields.

Controller Model: Set to the Raven model you have. For example: 440 or 460 etc. This setting can not be changed once the configuration is used by one or more fields.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Usually set to GALLONS. Set to Units/Acre of application.

Ground Speed Sensor: Set primary speed sensor to GPS. SERIAL is not recommended. RADAR is an option but you will need additional cabling to connect the radar to your monitor. All Ag Leader GPS except GPS 1000 will work for ground speed.

Note: This setting affects all configurations.

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If spray boom is 20 feet behind GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Ignore setting. Swath automatically comes from serial port of Raven. The swath on the PF automatically changes as boom sections are turned ON or OFF.

Tgt Units: Contrler Units: Normally set to 1:1.0000. This ratio is used to convert the units in a target file (.tgt) to the units of application.

Example: Tgt file in pints/ac of Treflan, Raven applies based on gallons/ac. If tank mix is 1 pint of Treflan / 10 gallon water, then set to 1:10.0000. The PF will read the pints/acre rate out of the tgt file, multiply it by ten to convert it to gallons/ac and send that rate to the Raven console as the rate to be applied.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0.

Actual Rate Scale Factor: This setting is required to prevent data loss in the log file (YLD file) when the units/sec of application get above 3. Use the chart below for setting. The rate actually applied and rate displayed on PF is unaffected by this setting. When the log file is mapped in Ag Leader's SMS mapping program, the mapped actual rate will be $1/10^{th}$ of the real rate if the Actual Rate Scale Factor is 0.100. If it is 0.010, the mapped actual rate will be $1/100^{th}$ the real rate. The mapped actual rate can be scaled back up in SMS. The summary actual rate in SMS is unaffected by this setting.

Avg. Speed	*Swath*	*Application Rate between*	*Scale Factor*
0-25 mph	0-80 ft	0-10 units/ac	*1.000*
0-10 mph	0-80 ft	11-100 units/ac	*1.000*
11-15 mph	0-50 ft	11-100 units/ac	*1.000*
11-15 mph	51-80 ft	11-100 units/ac	*0.100*
16-25 mph	0-80 ft	11-100 units/ac	*0.100*
0-25 mph	0-80 ft	101-500 units/ac	*0.100*
0-10 mph	0-80 ft	501-1000 units/ac	*0.100*
11-15 mph	0-50 ft	501-1000 units/ac	*0.100*
11-15 mph	51-80 ft	501-1000 units/ac	*0.010*
16-25 mph	0-80 ft	501-1000 units/ac	*0.010*
0-25 mph	0-80 ft	1001+ units/ac	*0.010*

2. If you have a 440, 450, or 460 ignore this step, otherwise press CONTRLER SETTINGS key. Set the following:

   Controller Channel: Set to channel of Raven to record or control rate.

   Controller Operating Mode: Set to liquid or granular, whichever type the Raven console is controlling.

3. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key.

   Target Rate Outside Field: This only pertains to using a .tgt prescription file.

   Set to ZERO if want rate outside field to be zero.

   Set to USE LAST if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when the vehicle is being falsely detected outside of the field during the outside pass.

   Set to TGT DEFAULT if want rate outside field to be the default rate stored in the .tgt prescription file.

   Controller Time Delay: Set to 3 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

Actual Rate Units: Ignore this setting.

Log Actual Rate: Set to YES to log actual rate to card. Set to No, otherwise.

4. This completes all the settings for one configuration. Press EXIT key twice to return to screen showing all configurations or press EXIT key 3 times and menu key to return to main operating system.

Activating Configuration and Setting .tgt Prescription File

5. Exit back to main screen.

   a) Press FIELD key twice.

   b) Select appropriate field and press VIEW CONFIG key.

   c) Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active. (All other configs must be unchecked first).

   d) If you will be using a .tgt prescription file. Press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

   e) Select .tgt file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

   Press ACCEPT key to accept field.

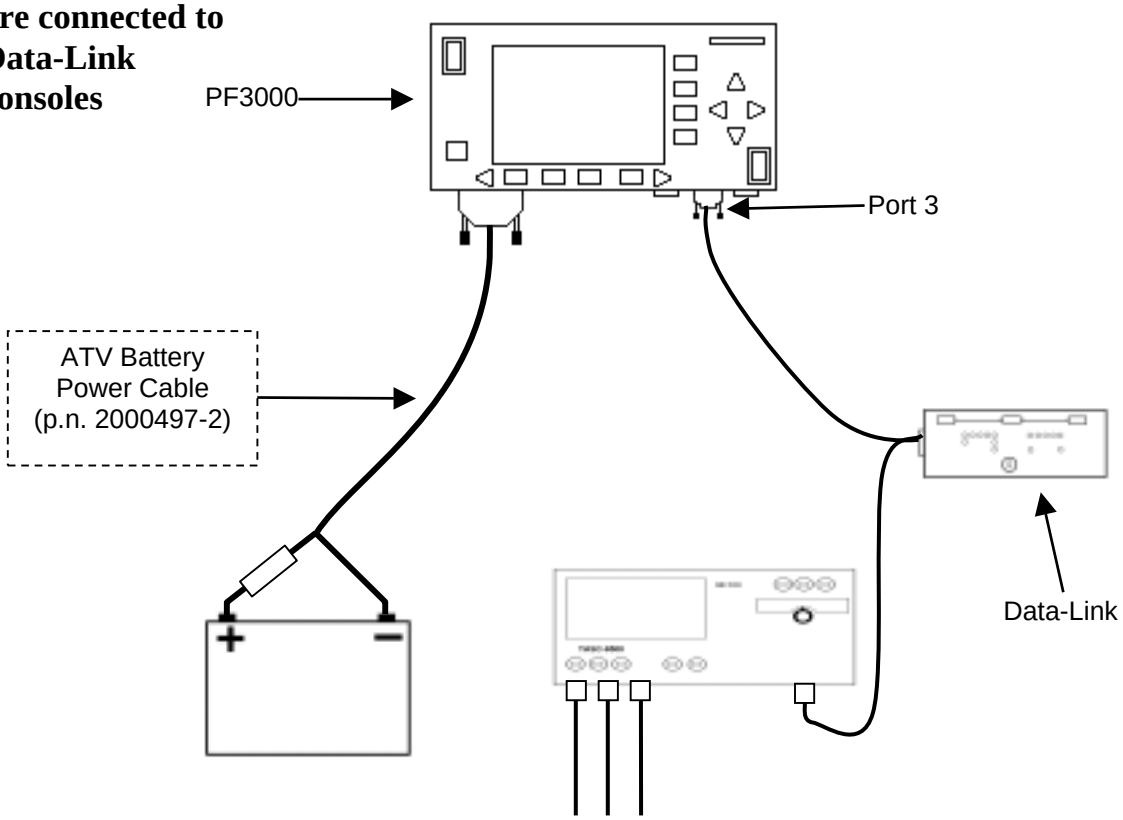
Settings for Raven.

Under Data Menu key, set Baud = 9600, Trig = 1, Unit = sec, Dlog = ON. To turn the rate change alarm OFF set Rate = OFF. On some Ravens the Dlog setting has to be reset when the console is turned ON.

Additional Instructions

For more information on setting Target Rate, display items, creating and using .tgt prescription files and logging actual rate see the Operation Section in this manual.

Cable attachment for Mid-Tech controllers that are connected to Data-Link consoles



Cable attachment from Mid-Tech console to monitor

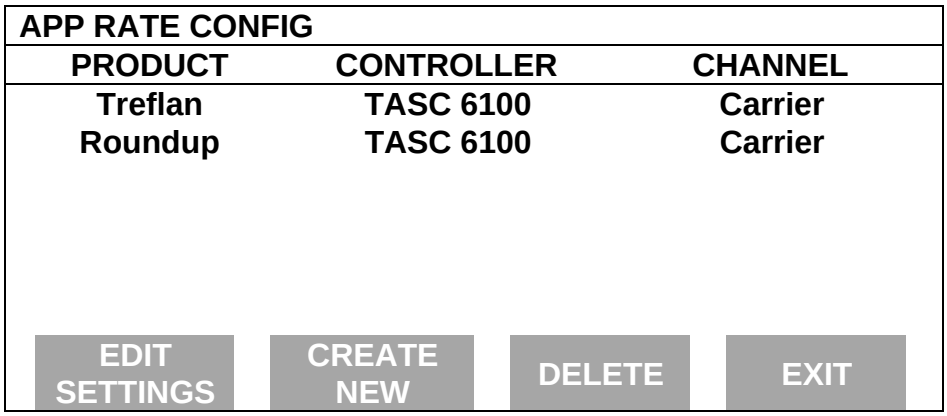
The Mid-Tech Data-Link console provides a serial cable connection between the PF and Ag Logix or the TASC controller. The serial cable enables the PF3000 to control and record the rate. It also provides swath width (based on the number of booms on), ground speed, actual rate and area count status (based on Master Switch) information to the PF3000.

Setting up Mid-Tech controllers that are connected to Data-Link consoles

Complete the following steps to set up for Ag Logic, TASC 6000, 6100, 6200, 6300, 6500, 6600 with Data Link.

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for a Mid-Tech.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear.



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to MIDTECH. This setting can not be changed once the configuration is used by one or more fields.

Controller Model: Set to the MIDTECH model you have. For example: TASC 6100 etc. This setting can not be changed once the configuration is used by one or more fields.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to Units/Acre of application. Set to GALLONS if applying liquid. Set to POUNDS if applying granular product.

Ground Speed Sensor: Set primary speed sensor to SERIAL. The monitor will get ground speed from the serial cable connection to the Mid-Tech. Leave the secondary speed sensor set to WHEEL and do not change the Speed Sensor Pulses/100 ft. Also do not perform a distance calibration using wheel selection. No calibration is needed when primary speed is set to SERIAL.

Note: This setting affects all configurations.

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If spray boom is 20 feet behind GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Ignore setting. Swath automatically comes from serial port of Mid-Tech. The swath on the PF automatically changes as boom sections are turned ON or OFF.

Tgt Units: Contrler Units: This only pertains to using a .tgt prescription file. Normally set to 1:1.0000. This ratio is used to convert the units in a target file (.tgt) to the units of application.

> Example: Tgt file in pints/ac of Treflan, Mid-Tech applies based on gallons/ac. If tank mix is 1 pint of Treflan / 10 gallon water, then set to 1:10.0000. The PF will read the pints/acre rate out of the .tgt file, multiply it by ten to convert it to gallons/ac and send that rate to the Mid-Tech console as the rate to be applied.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0.

Actual Rate Scale Factor: This setting is required to prevent data loss in the log file (YLD file) when the units/sec of application get above 3. Use the chart below for setting. The rate actually applied and rate displayed on PF is unaffected by this setting. When the log file is mapped in Ag Leader's SMS mapping program, the mapped actual rate will be $1/10^{th}$ of the real rate if the Actual Rate Scale Factor is 0.100. If it is 0.010, the mapped actual rate will be $1/100^{th}$ the real rate. The mapped actual rate can be scaled back up in SMS. The summary actual rate in SMS is unaffected by this setting.

Avg. Speed	*Swath*	*Application Rate between*	*Scale Factor*
0-25 mph	0-80 ft	0-10 units/ac	*1.000*
0-10 mph	0-80 ft	11-100 units/ac	*1.000*
11-15 mph	0-50 ft	11-100 units/ac	*1.000*
11-15 mph	51-80 ft	11-100 units/ac	*0.100*
16-25 mph	0-80 ft	11-100 units/ac	*0.100*
0-25 mph	0-80 ft	101-500 units/ac	*0.100*
0-10 mph	0-80 ft	501-1000 units/ac	*0.100*
11-15 mph	0-50 ft	501-1000 units/ac	*0.100*
11-15 mph	51-80 ft	501-1000 units/ac	*0.010*
16-25 mph	0-80 ft	501-1000 units/ac	*0.010*
0-25 mph	0-80 ft	1001+ units/ac	*0.010*

2. Press CONTRLER SETTINGS key. Set the following:

   Controller Channel: Set to channel of Mid-Tech to record or control rate.

   NOTE: This setting will not appear for Ag Logix, TASC 6000 or TASC 6100 controllers.

   Controller Operating Mode: Set to liquid or granular, whichever type the Mid-Tech console is controlling.

   NOTE: This setting will not appear for TASC 6000 or TASC 6600 controllers.

3. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key.

   Target Rate Outside Field: This only pertains to using a .tgt prescription file.

Set to ZERO if want rate outside field to be zero.

Set to USE LAST if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when the vehicle is being falsely detected outside of the field during the outside pass.

Set to TGT DEFAULT if want rate outside field to be the default rate stored in the .tgt prescription file.

Controller Time Delay: Set to 3 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

Actual Rate Units: Ignore this setting.

Log Actual Rate: Set to YES to log actual rate to card. Set to No, otherwise.

This completes all the settings for one configuration. Press EXIT key twice to return to screen showing all configurations or press EXIT key 3 times and menu key to return to main operating system.

Activating Configuration and Setting .tgt Prescription File

4. Exit back to main screen.

   a) Press FIELD key twice.

   b) Select appropriate field and press VIEW CONFIG key.

   c) Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active. (All other configs must be unchecked first).

   d) If you will be using a .tgt prescription file. Press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

   e) Select .tgt file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

   f) Press ACCEPT key to accept field.

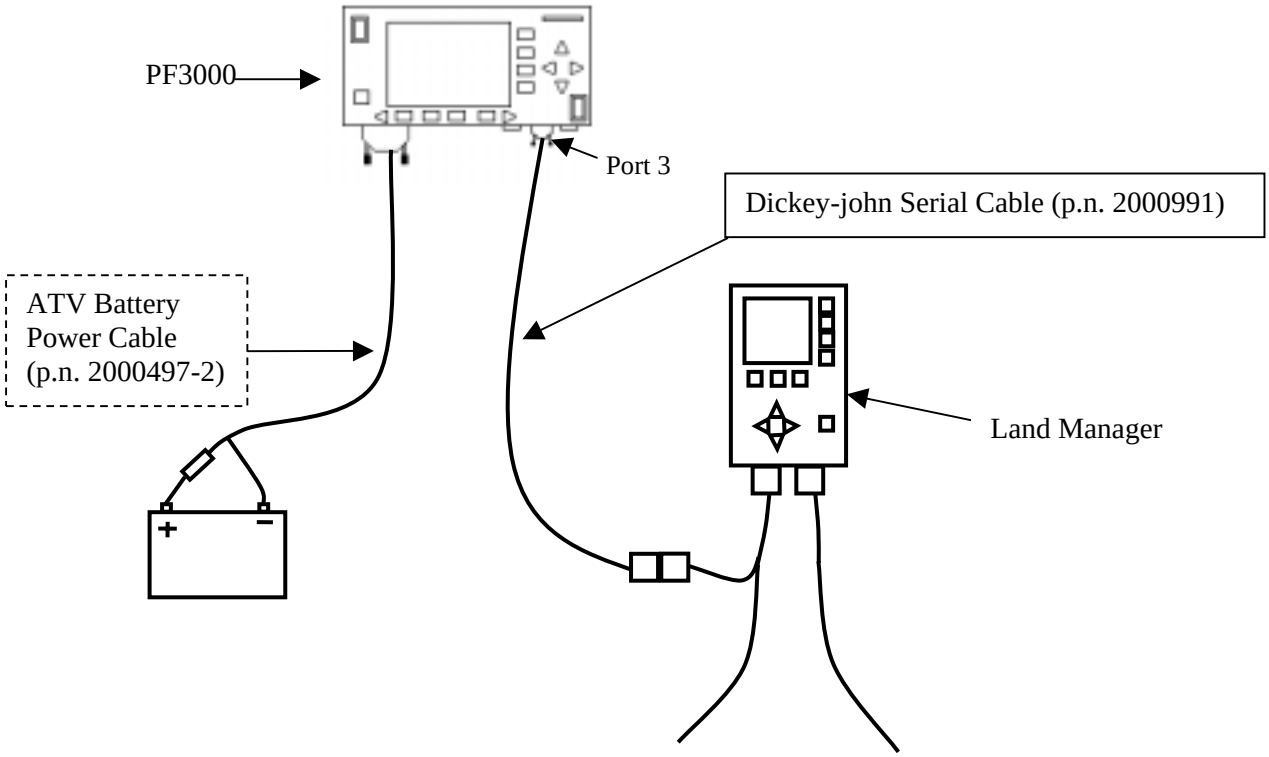
Settings on Data-Link

Move the switch to "External Enable" position. The lights on the Data-Link will flash back and forth when communication is established with the PF. The Channel switch on Mid-Tech, must be in the "Alt-Rate" position for PF to send target rate to controller. If you do not want PF to control target rate, but want it to record the actual rate from a channel, set the channel switch on Mid-Tech to "ON" or "Standard" (exception: on Ag Logix, PF can not receive actual rate without controlling target rate).

Additional Instructions

For more information on setting Target Rate, display items, creating and using .tgt prescription files and logging actual rate see the Operation Section in this manual.

Cable attachment for DICKEY-john Land Manager or Land Manager II controller



Cable attachment for DICKEY-john Land Manager console

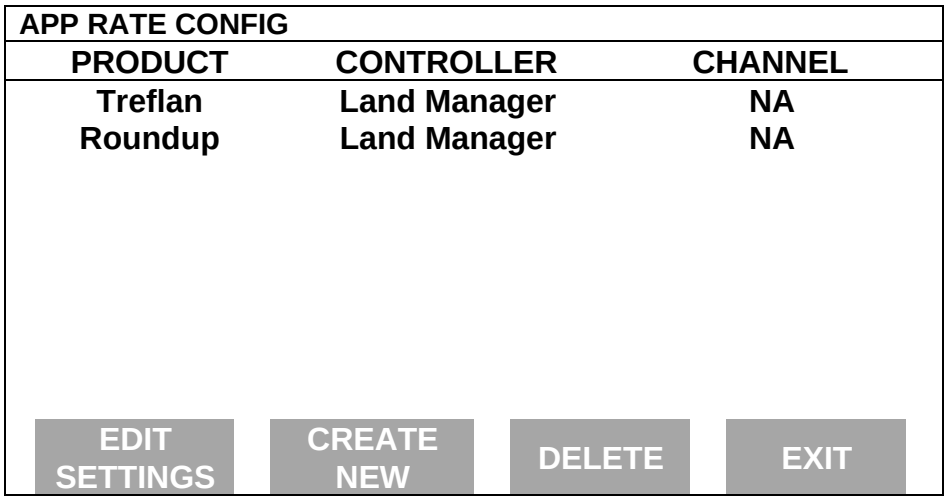
The DICKEY-john Serial Cable enables the PF3000 to control and record the rate. It also provides swath width (based on the number of booms on), ground speed, actual rate and area count status (based on Master Switch) information to the PF3000.

Setup for a DICKEY-john Land Manager or Land Manager II controller

Complete the following steps to set up for Land Manager or Land Manager II controllers.

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for a DICKEY-john.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear.



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to DICKEY-JOHN. This setting can not be changed once the configuration is used by one or more fields.

Controller Model: Set to LAND MANAGER. This setting can not be changed once the configuration is used by one or more fields.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to GALLONS if applying liquid. Set to POUNDS if applying granular product. Set to Units/Acre of application.

Ground Speed Sensor: Set primary speed sensor to SERIAL. The monitor will get ground speed from the serial cable connection to the Land Manager. Leave the secondary speed sensor set to WHEEL and do not change the Speed Sensor Pulses/100 ft. Also do not perform a distance calibration using wheel selection. No calibration is needed when primary speed is set to SERIAL.

Note: This setting affects all configurations.

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If spray boom is 20 feet behind GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Ignore setting. Swath automatically comes from serial port of the DICKEY-john. The swath on the PF automatically changes as boom sections are turned ON or OFF.

Tgt Units: Contrler Units: Normally set to 1:1.0000. This ratio is used to convert the units in a target file (.tgt) to the units of application.

Example: Tgt file in pints/ac of Treflan, Land Manager applies based on gallons/ac. If tank mix is 1 pint of Treflan / 10 gallon water, then set to 1:10.0000. The PF will read the pints/acre rate out of the .tgt file, multiply it by ten to convert it to gallons/ac and send that rate to the Land Manager console as the rate to be applied.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0.

Actual Rate Scale Factor: This setting is required to prevent data loss in the log file (YLD file) when the units/sec of application get above 3. Use the chart below for setting. The rate actually applied and rate displayed on PF is unaffected by this setting. When the log file is mapped in Ag Leader's SMS mapping program, the mapped actual rate will be $1/10^{th}$ of the real rate if the Actual Rate Scale Factor is 0.100. If it is 0.010, the mapped actual rate will be $1/100^{th}$ the real rate. The mapped actual rate can be scaled back up in SMS. The summary actual rate in SMS is unaffected by this setting.

Avg. Speed	*Swath*	*Application Rate between*	*Scale Factor*
0-25 mph	0-80 ft	0-10 units/ac	*1.000*
0-10 mph	0-80 ft	11-100 units/ac	*1.000*
11-15 mph	0-50 ft	11-100 units/ac	*1.000*
11-15 mph	51-80 ft	11-100 units/ac	*0.100*
16-25 mph	0-80 ft	11-100 units/ac	*0.100*
0-25 mph	0-80 ft	101-500 units/ac	*0.100*
0-10 mph	0-80 ft	501-1000 units/ac	*0.100*
11-15 mph	0-50 ft	501-1000 units/ac	*0.100*
11-15 mph	51-80 ft	501-1000 units/ac	*0.010*
16-25 mph	0-80 ft	501-1000 units/ac	*0.010*
0-25 mph	0-80 ft	1001+ units/ac	*0.010*

2. Press CONTRLER SETTINGS key. Set the following:

Controller Operating Mode: Set to liquid, granular or NH_3 whichever type the Land Manager console is controlling.

3. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key.

   Target Rate Outside Field: This only pertains to using a .tgt prescription file.

   Set to ZERO if want rate outside field to be zero.

   Set to USE LAST if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when the vehicle is being falsely detected outside of the field during the outside pass.

   Set to TGT DEFAULT if want rate outside field to be the default rate stored in the .tgt prescription file.

   Controller Time Delay: Set to 3 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

   Actual Rate Units: Ignore this setting.

   Log Actual Rate: Set to YES to log actual rate to card. Set to NO, otherwise.

   This completes all the settings for one configuration. Press EXIT key twice to return to screen showing all configurations or press EXIT key 3 times and menu key to return to main operating system.

Activating Configuration and Setting .tgt Prescription File

4. Exit back to main screen.

    a) Press FIELD key twice.

    b) Select appropriate field and press VIEW CONFIG key.

    c) Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active. (All other configs must be unchecked first).

    d) If you will be using a .tgt prescription file. Press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

    e) Select .tgt file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

    Press ACCEPT key to accept field.

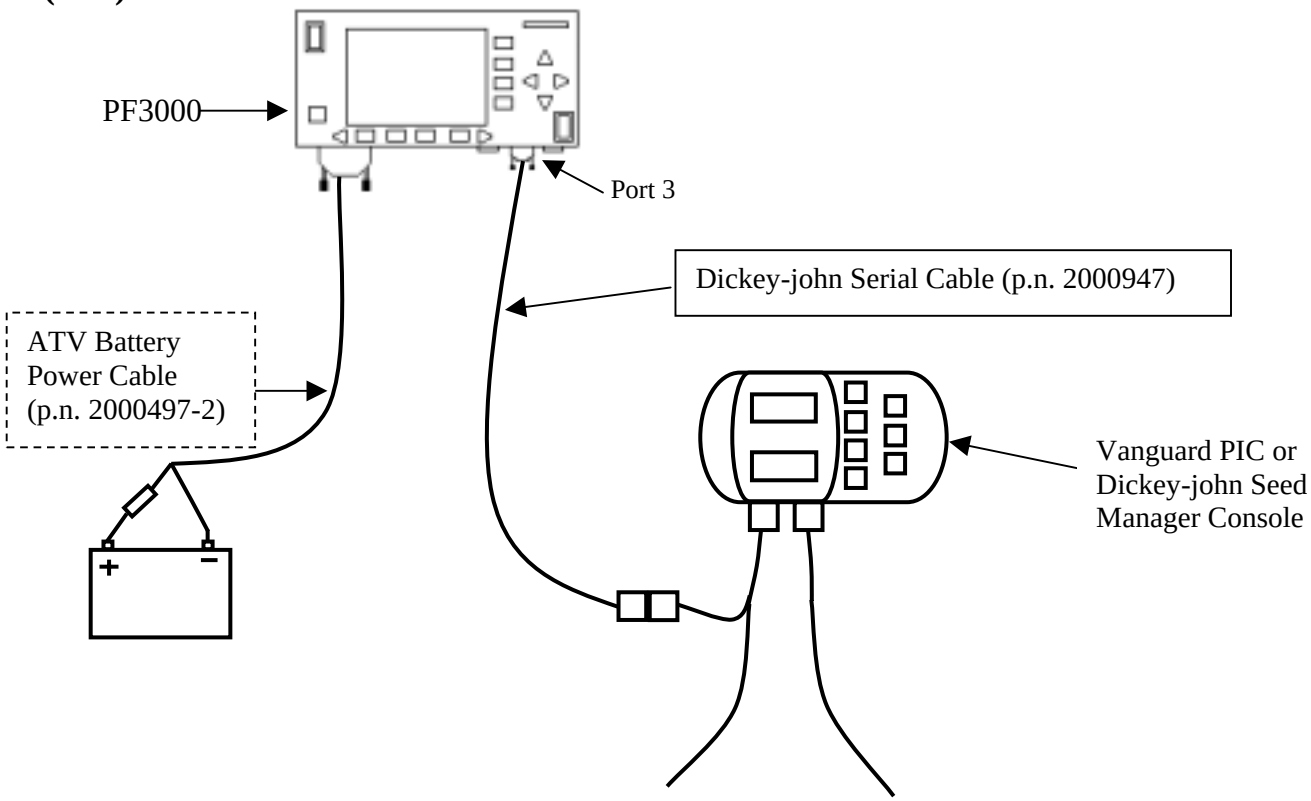
Settings on Land Manager Console

On Land Manager console, press the SYSTEM key. Select **Configuration** and press Enter. Select **Serial Port** and press Enter. Verify that "Active Config" is set to **GPS**. If it is not, select **GPS** and press Enter. Verify that the GPS selection is 9600-N-8. If it is not, select **Modify Active** and set Baud Rate=9600, Parity=None, Data Bits=8 and Connect=Direct.

Additional Instructions

For more information on setting Target Rate, display items, creating and using .tgt prescription files and logging actual rate see the Operation Section in this manual.

Cable attachment for DICKEY-john Seed Manager or Vanguard VM-2500 (PIC)



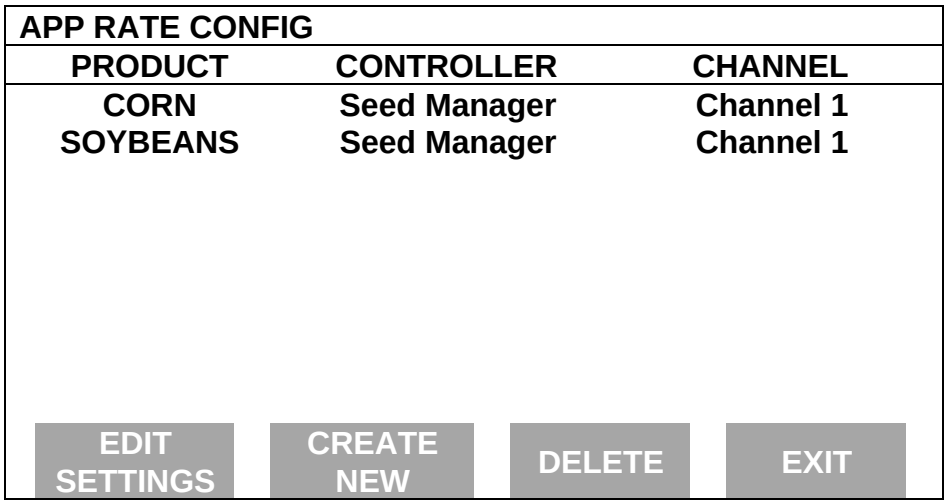
The DICKEY-john serial cable enables the PF3000 to record the population rate. It also provides swath width (based on the number of non-failed rows), ground speed, actual rate and area count status information to the PF3000.

Setup for DICKEY-john Seed Manager or Vanguard VM-2500 (PIC)

Complete the following steps to set up for Seed Manager or Vanguard VM-2500 PIC planter monitor.

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for a DICKEY-john.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear.



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to DICKEY-JOHN. This setting can not be changed once the configuration is used by one or more fields.

Controller Model: Set to SEED MANAGER. This setting can not be changed once the configuration is used by one or more fields.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to SEEDS.

Ground Speed Sensor: Set primary speed sensor to SERIAL. The monitor will get ground speed from the serial cable connection to the Seed Manager. Leave the secondary speed sensor set to WHEEL and do not change the Speed Sensor Pulses/100 ft. Also do not perform a distance calibration using wheel selection. No calibration is needed when primary speed is set to SERIAL.

Note: This setting affects all configurations.

App Distance From GPS: Ignore setting. This setting pertains to using a .tgt prescription file.

Full Swath: Ignore setting. Swath automatically comes from serial port of the DICKEY-john.

Tgt Units: Contrler Units: Ignore setting. This setting pertains to using a .tgt prescription file.

Target Rate Increment: Ignore setting.

Actual Rate Scale Factor: Set to 1.000.

Activating Configuration

2. Exit back to main screen.

    a) Press FIELD key twice.

    b) Select appropriate field and press VIEW CONFIG key.

    c) Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active. (All other configs must be unchecked first).

    d) Press ACCEPT key to accept field.

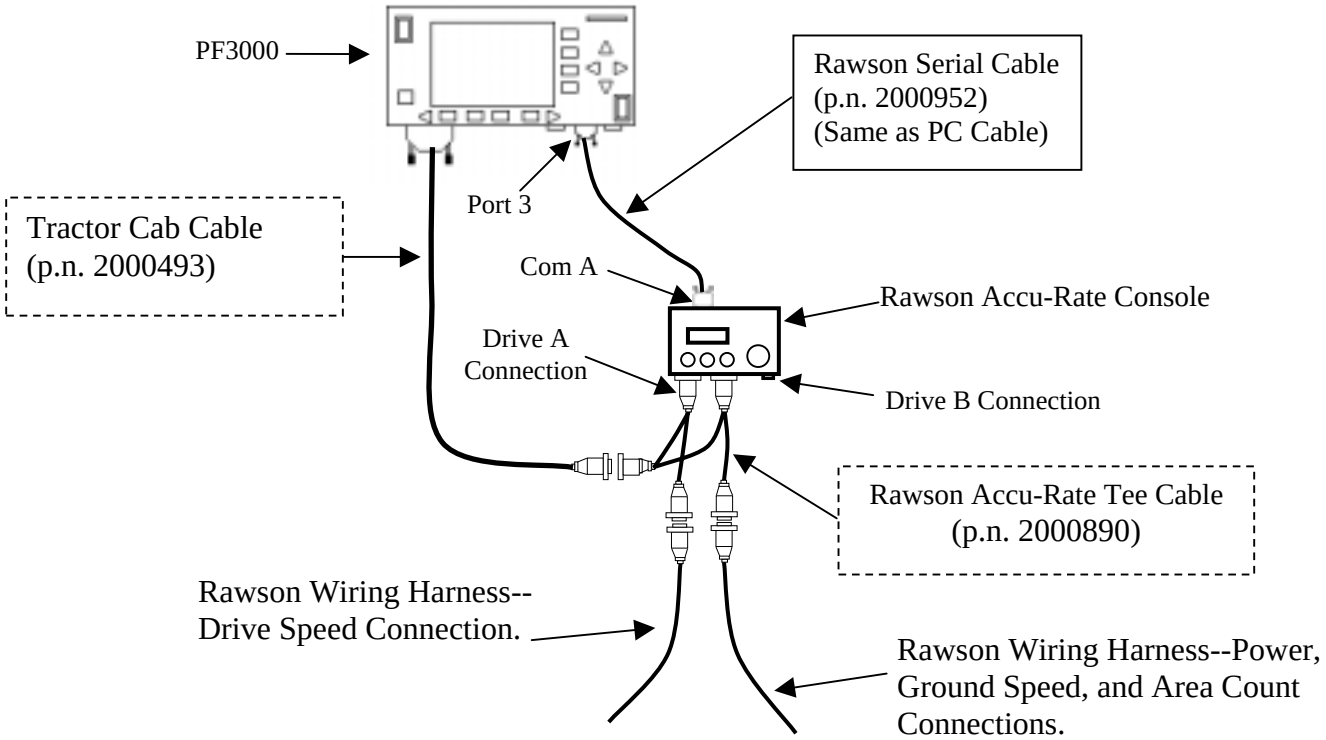
Settings on Seed Manager Console

There are no settings required on the Seed Manager to establish communication.

Additional Instructions

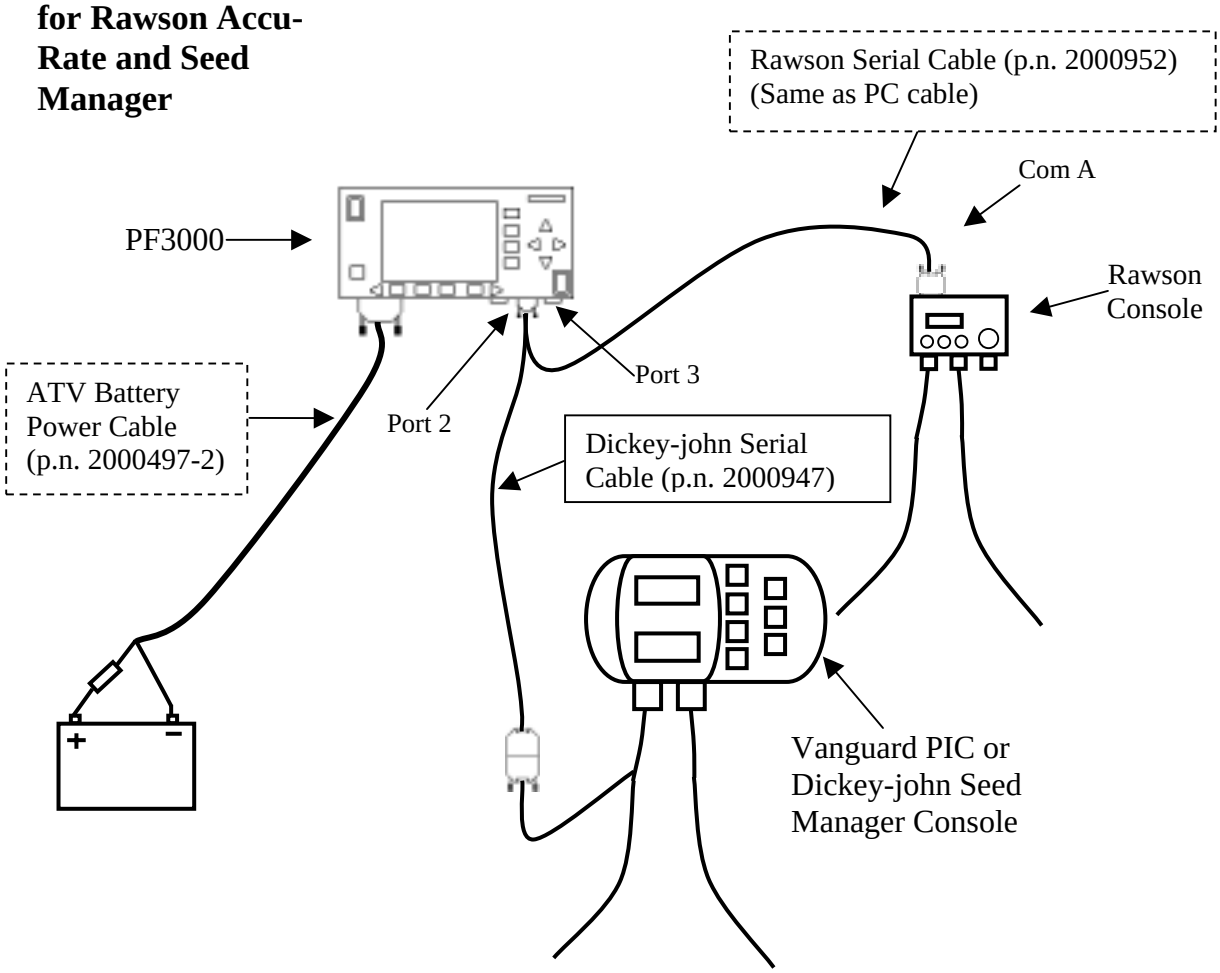
For more information on setting Target Rate, display items, creating and using .tgt prescription files and logging actual rate see the Operation Section in this manual.

Cable attachment for Rawson Accu-Rate Controller



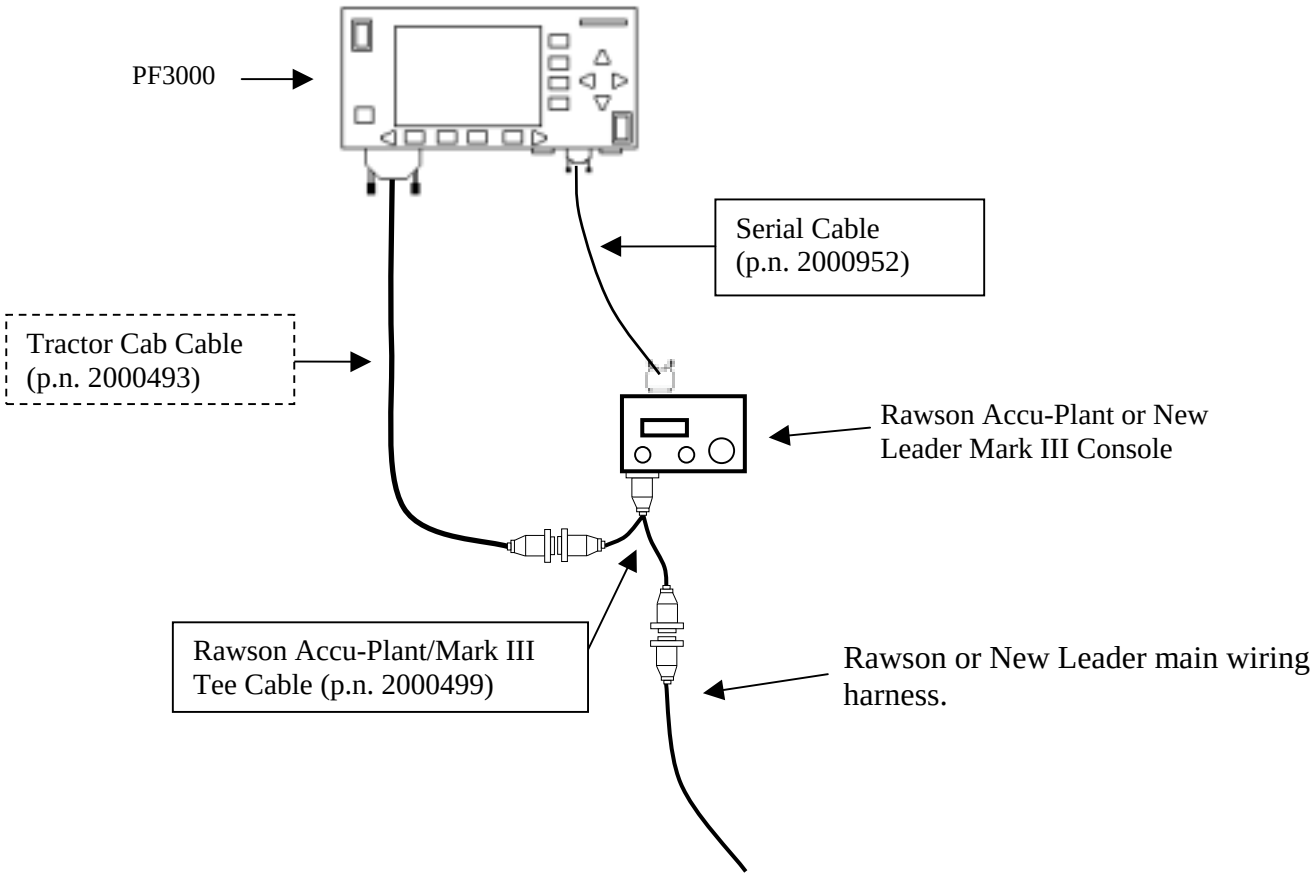
The Rawson serial cable (p.n. 2000952) enables the PF3000 to control the rate of the Rawson processor. The Rawson Accu-Rate Tee Cable (p.n. 2000890) provides power, radar ground speed and actual rate (based on drive rpm) signals to the PF.

Cable attachment for Rawson Accu-Rate and Seed Manager



The diagram above shows connections required for the PF to control the population of the Accu-Rate and record the actual population as measured by the Seed Manager or Vanguard VM 2500 (PIC). The ground speed, swath width and area count status come from the Seed Manager.

Cable attachment for Rawson Accu-Plant Controller



Cable attachment for Rawson Accu-Plant Controller.

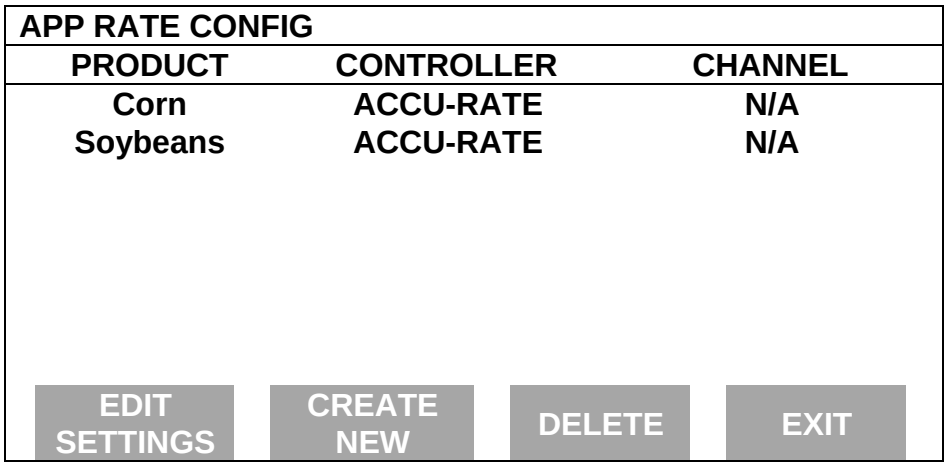
The Rawson serial cable (p.n. 2000952) enables the PF3000 to control the rate of the Rawson processor. The Rawson Accu-Plant Tee Cable (p.n. 2000499) provides power, radar ground speed and actual rate (based on drive rpm) signals to the PF.

Setup for Rawson Accu-Rate or Accu-Plant Controller

Complete the following steps to setup for Rawson Accu-Rate or Accu-Plant.

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations for a Accu-Rate controller.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear:



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to RAWSON.

Controller Model: Set to ACCU-RATE or ACCU-PLANT.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to Units/Acre of application. Set to SEEDS if planting. Set to TONS if applying lime. Set to POUNDS if applying fertilizer. Set to GALLONS if applying liquid.

Ground Speed Sensor: Set to RADAR or GPS. All Ag Leader GPS except GPS 1000 will work for ground speed. If getting actual rate from Seed Manger Planter monitor set to SERIAL.

Note: This setting affects all configurations

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If the planter is 20 feet behid GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Set to full swath of applicator.

Tgt Units: Contrler Units: Normally set to 1:1.0000. This ratio is used to convert the units in a target file (.tgt) to the units of application. Example: Tgt file in pounds/ac of lime, Rawson applies lime in tons/ac. Set to 1:0.0005 to convert pounds/acre to tons/ac. The PF will read the rate from the .tgt prescription file and multiply it by 0.0005 and send that rate to the Rawson processor.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0. Suggested setting when planting corn is 500.0 or 1000.0. For planting beans use 1000.0 or 5000.0 or 10000.0. For applying lime use 0.1. For applying fertilizer or liquid use 1.0 or 10.0.

Actual Rate Scale Factor: Set to 1.000.

Press CONTRLER SETTINGS key. Set the following:

Nominal Rate: If the PF is not controlling the rate, ignore this setting. If the PF is controlling the rate, this setting must equal the nominal rate setting in the Rawson processor.

Press the MODE key on the Rawson processor until the nominal rate appears. The nominal rate should appear as follows for the different modes of the Rawson processor.

"Sds/A=x,xxx,xxx" – Rawson plant mode
"Rate=xxxx.x Lb/A" – Rawson dry fertilizer mode
"Rate=xx.x Gal/A" – Rawson liquid fertilizer mode

Percent rate change: If the PF is not controlling the rate, ignore this setting. If the PF is controlling the rate, this setting must equal the "Steps" setting in the Rawson processor.

The "Steps" setting is not changeable or viewable in the Accu-Plant processor. The settings are…

4.00% for plant mode of Accu-Plant processor
6.66% for fertilizer mode of Accu-Plant processor

The "Steps" setting is changeable in the Accu-Rate processor. Press the MODE key on the Accu-Rate processor until "Steps x.x%" appears. The default settings for each mode are below.

4.00% for plant mode of Accu-Rate processor
6.66% for fertilizer mode of Accu-Rate processor

Cal. number for act. rate: Use the formula below for the appropriate mode to determine this setting.

Planting mode - Press MODE key on processor to view the "# of seeds=xxx.x" and "No. of Rows=xx" setting.

$$\frac{\text{\# of seeds}}{5} \times \text{No. of rows} \times 10 = \text{Cal. number for act. rate}$$

Liquid fertilizer mode - Press MODE key on processor to view "Pump Disp x.xxxx", "RateSetting xx.x" and "Ratio=xx.xx:1" setting.

$$\frac{\text{Pump Disp} \times \text{Rate Setting} \times 10000}{\text{Ratio}} = \text{Cal. number for act. rate}$$

Dry fertilizer mode - Press MODE key on processor to view "Del. Rate=xxx.xx", "Mat'l=xxx.x Lb", "Rate Setting xx.xx" and "Ratio=xx.xx:1" setting.

$$\frac{\text{Del. Rate x Mat'l x Rate Setting x .5787}}{\text{Ratio}} = \text{cal. number}$$

NOTE: Actual rate will be 1/10th of real actual rate (except for lime). If cal. number is over 6400, divide cal. number by 10. Ex. 7000/10=700 (act. rate will be 1/100th of real actual rate). If gate setting changes, switch configurations and enter new cal. number.

Actual Rate Source: Set to *DRIVE RPM*. Actual Rate will be determined based on rpm of hydraulic drive. If you are planting and have a Dickey-john Seed Manager monitor and you want to get the actual rate from it, set this to *SEED MANGR*.

2. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key.

Target Rate Outside Field: This only pertains to using a target file.
Set to *ZERO* if want rate outside field to be zero.

Set to *USE LAST* if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when experiencing problems with the vehicle being falsely detected outside of the field during the outside pass.

Set to *TGT DEFAULT* if want rate outside field to be the default rate stored in the target rate file.

Controller Time Delay: Set to 2 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

Actual Rate Units: Ignore this setting.

Log Actual Rate: Set to *YES* to log actual rate to card. Set to *NO*, otherwise.

3. Exit back to main screen.

   a)Press FIELD key twice.

   b)Select appropriate field and press VIEW CONFIG key.

   c)Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active.(All other configs must be unchecked first).

   d)If you will be using a target file, press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

   e)Select target file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

   f)Press ACCEPT key to accept field.

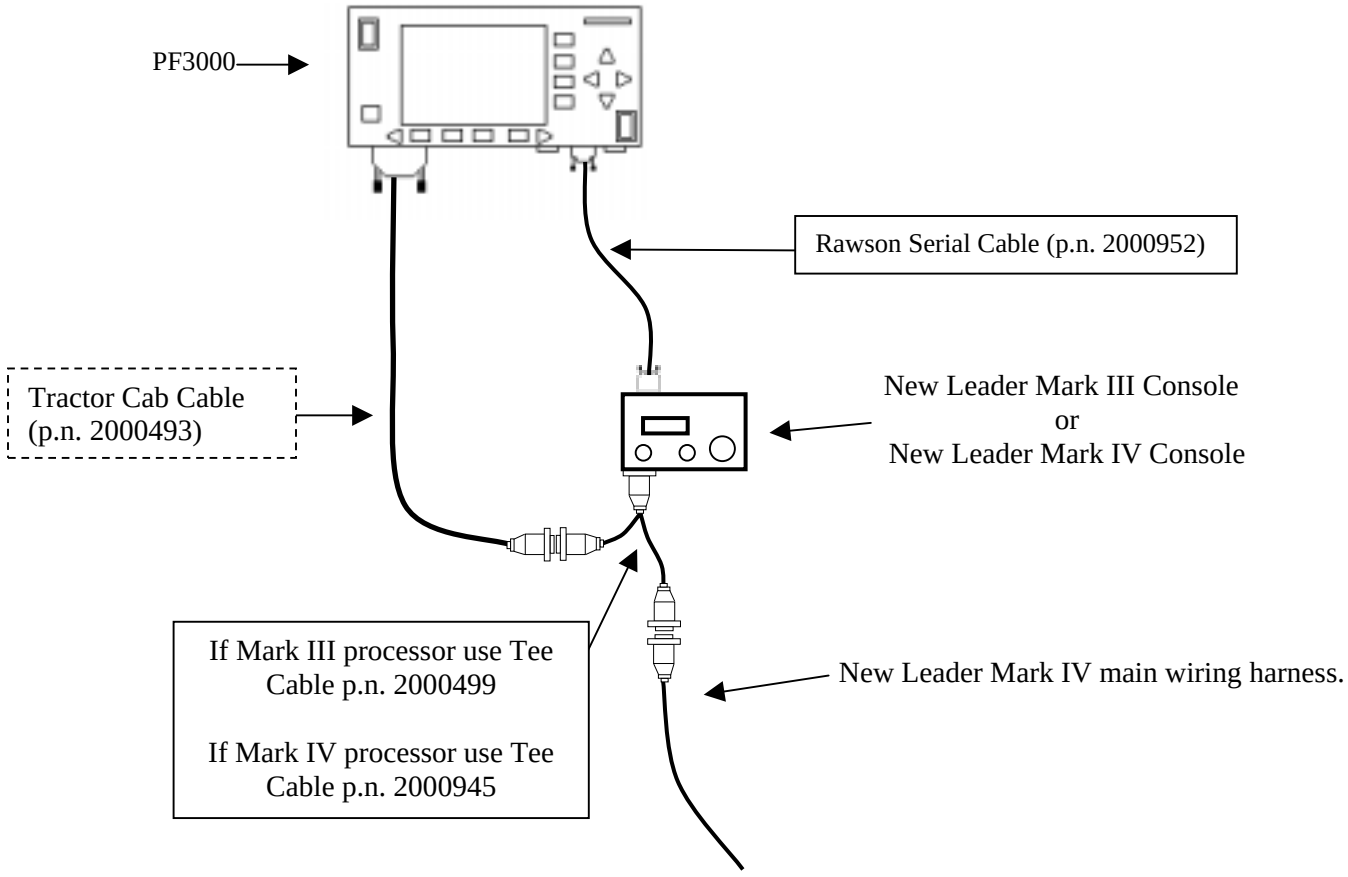
Settings on Rawson processor

If the PF is controlling the rate, the Rawson processor must be set to "GPS Mode" under the mode key. Otherwise, no settings need to be made on the Rawson processor.

Additional Instructions

For more information on setting Target Rate, display items, creating and using .tgt prescription files and logging actual rate see the Operation Section in this manual.

Cable attachment for New Leader Mark III or Mark IV processors



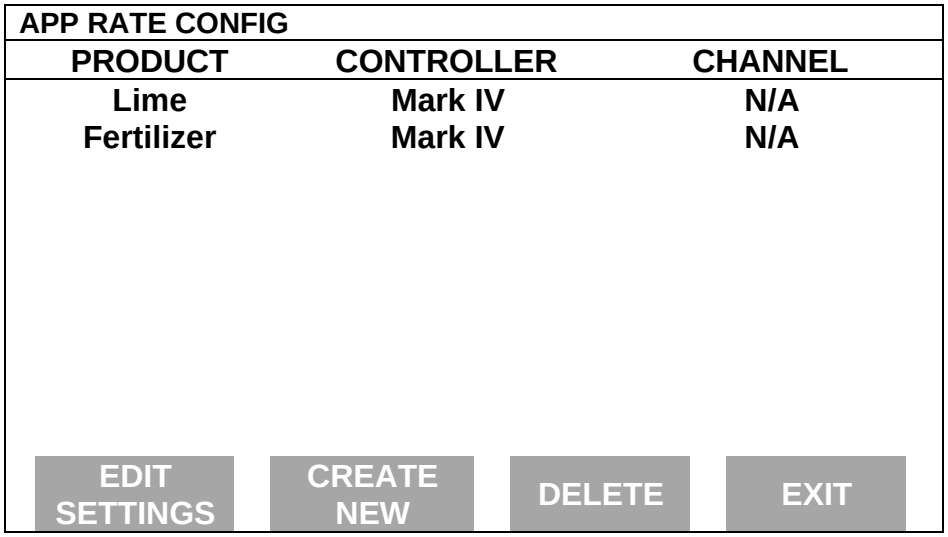
The New Leader tee cable (p.n. 2000945) provides power, radar ground speed and actual rate (based on drive rpm) signals to the PF. The Rawson Serial Cable (p.n. 2000952) enables the PF to control the rate of the New Leader processor.

Setup for New Leader Mark III or Mark IV controllers

Complete the following steps to setup for New Leader Mark III or Mark IV.

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for a Mark IV.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear:



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to NEW LEADER.

Controller Model: Set to MARK III or MARK IV

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to Units/Acre of application. Set to TONS if applying lime. Set to POUNDS if applying fertilizer.

Ground Speed Sensor: Set to RADAR or GPS. All Ag Leader GPS except GPS 1000 will work for ground speed.

Note: This setting affects all configurations.

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If the spinner is 20 feet behind GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Set to spread width of applicator.

Tgt Units: Contrler Units: Normally set to 1:1.0000. This ratio is used to convert the units in a target file (.tgt) to the units of application. Example: Tgt file in pounds/ac of lime, New Leader Mark processor applies lime in tons/ac. Set to 1:0.0005 to convert pounds/acre to tons/ac. The PF will read the rate from the .tgt prescription file and multiply it by 0.0005 and send that rate to the Mark processor.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0. Suggested setting for applying lime is 0.1. For applying fertilizer use 1.0 or 10.0.

Actual Rate Scale Factor: Set to 1.000 if applying lime. Set to 0.100 if applying fertilizer. This setting is required to prevent data loss in the log file (YLD file) when the units/sec of application get above 3. The rate actually applied and rate displayed on PF is unaffected by this setting. When the log file is mapped in Ag Leader SMS mapping program, the mapped actual rate will be $1/10^{th}$ of the real rate if the Actual Rate Scale Factor is 0.100. If it is 0.010, the mapped actual rate will be $1/100^{th}$ the real rate. The mapped actual rate can be scaled back up in SMS. The summary actual rate in SMS is unaffected by this setting.

Press CONTRLER SETTINGS key. Set the following:

Nominal Rate: If the PF is not controlling the rate, ignore this setting. If the PF is controlling the rate, this setting must equal the nominal rate setting in the Mark processor.

Press the MODE key on the Mark processor until the nominal rate appears. The nominal rate should appear as follows for the different modes of the Mark processor.

"Yield = xxxx Lb/A" – Fert Mode
"Yield = xx.x T/A" – Lime Mode

Percent rate change: If the PF is not controlling the rate, ignore this setting. If the PF is controlling the rate, this setting must equal 6.66%.

Cal. number for act. Rate: Use the formula below to dtermine this setting.

New Leader – Press Mode key on controller to view "FeedGate=xx.xx", "Mat'l=xxx.x Lb", and "Conv. Rate=x.xxx" settings. Use formula to determine cal. number.

$$\frac{\textit{Feed Gate x Mat'l x Conv. Rate x 1000 (5 if lime)}}{\textit{6.1}} = \text{cal. number}$$

NOTE: When As Applied data is mapped in mapping program, actual rate will be 1/10th of real actual rate (except for lime). If cal. number is over 6400, divide cal. number by 10. Ex. 7000/10=700 (mapped actual rate will be 1/100th of real actual rate). ***If feed gate setting changes, switch configurations and enter new cal. number.***

2. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key

Target Rate Outside Field: This only pertains to using a target file.
Set to *ZERO* if want rate outside field to be zero.

Set to *USE LAST* if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when experiencing problems with the vehicle being falsely detected outside of the field during the outside pass.

Set to *TGT DEFAULT* if want rate outside field to be the default rate stored in the target rate file.

Controller Time Delay: Set to 2 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

Actual Rate Units: Ignore this setting.

Log Actual Rate: Set to *YES* to log actual rate to card. Set to *NO*, otherwise.

3. Exit back to main screen.

a)Press FIELD key twice.

b)Select appropriate field and press VIEW CONFIG key.

c)Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active.(All other configs must be unchecked first).

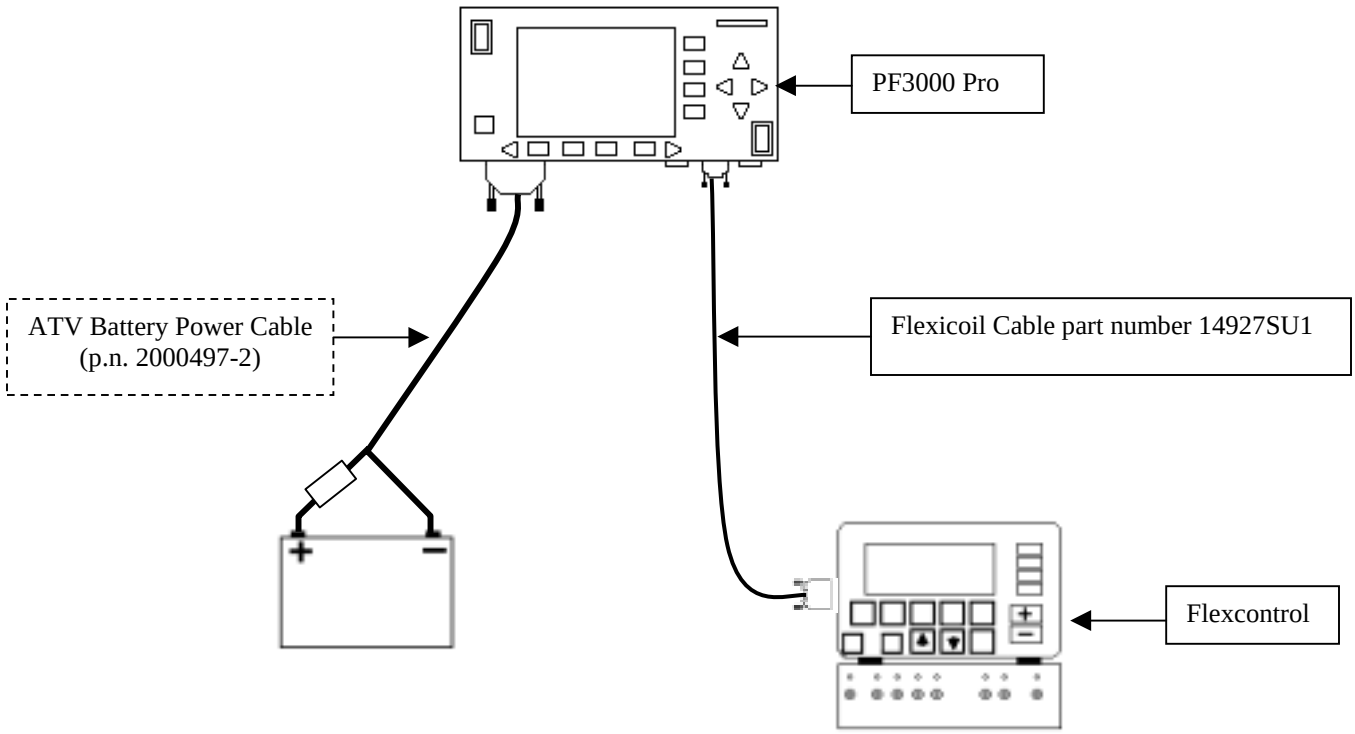
d)If you will be using a target file, press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

e)Select target file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

f)Press ACCEPT key to accept field.

Settings on New Leader processor	If the PF is controlling the rate, the New Leader processor must be set to "GPS Mode" under the mode key. Otherwise, no settings need to be made on the New Leader processor.
Additional Instructions	For more information on setting Target Rate, display items, creating and using .tgt prescription files and logging actual rate see the Operation Section of this manual.

Cable attachment for Flexcontrol controller

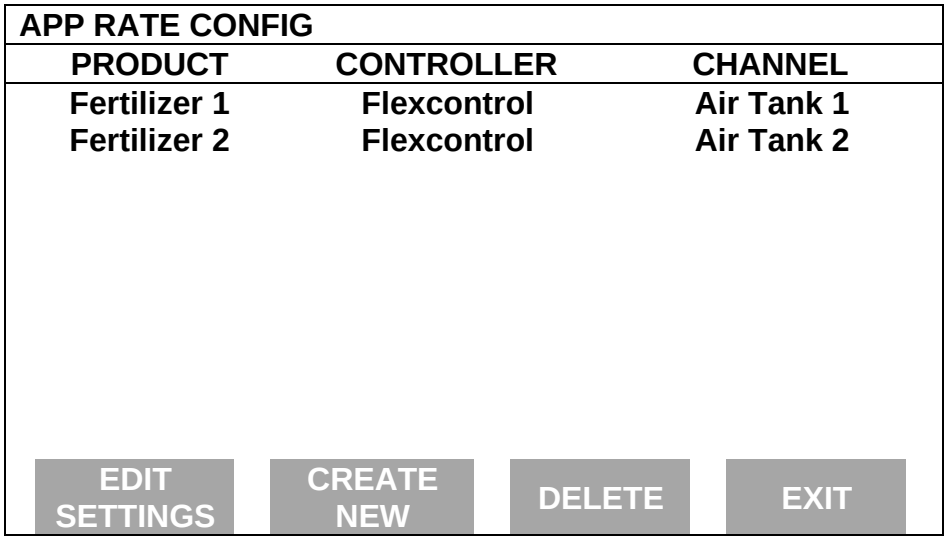


The Serial cable connecting between the PF and Flexcontrol enables the PF to control the rate. It also provides ground speed, swath width (based on number of boom sections on) and actual rate information to the PF.

Setup for Flexcontrol controller

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for the Flexcontrol controller.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear:



1. Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

   Controller Make: Set to FLEXICOIL.

   Controller Model: Set to FLEXCONTROL

   Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

   Units: Set to Units/Acre of application. Set to POUNDS if applying fertilizer. Set to GALLONS if applying liquid.

Ground Speed Sensor: Set primary speed sensor to SERIAL. The monitor will get ground speed from the serial cable connection to the Flexcontrol. Leave the secondary speed sensor set to WHEEL and do not change the Speed Sensor Pulses/100 ft. Also do not perform a distance calibration using wheel selection. No calibration is needed when primary speed is set to SERIAL.

Note: This setting affects all configurations.

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If the boom is 20 feet behid GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Ignore setting. Swath automatically comes from serial port of Flexcontrol. The swath on the PF automatically changes as boom sections are turned ON or OFF.

Tgt Units: Contrler Units: Normally set to 1:1.0000. This ratio is used to convert the units in a .tgt prescription file to the units of application.

Example: Tgt file in pints/ac of Treflan, Flexcontrol applies based on gallons/ac. If tank mix is 1 pint of Treflan / 10 gallon water, then set to 1:10.0000. The PF will read the pints/acre rate out of the .tgt file, multiply it by ten to convert it to gallons/ac and send that rate to the Flexcontrol console as the rate to be applied.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0. For applying fertilizer or liquid use 1.0 or 10.0.

Actual Rate Scale Factor: This setting is required to prevent data loss in the log file (YLD file) when the units/sec of application get above 3. Use the chart below for setting. The rate actually applied and rate displayed on PF is unaffected by this setting. When the log file is mapped in Ag Leader's SMS mapping program, the mapped actual rate will be $1/10^{th}$ of the real rate if the Actual Rate Scale Factor is 0100. If it is 0.010, the mapped actual rate will be $1/100^{th}$ the real rate. The mapped actual rate can be scaled back up in SMS. The summary actual rate in SMS is unaffected by this setting.

Avg. Speed	*Swath*	*Application Rate between*	*Scale Factor*
0-25 mph	0-80 ft	0-10 units/ac	*1.000*
0-10 mph	0-80 ft	11-100 units/ac	*1.000*
11-15 mph	0-50 ft	11-100 units/ac	*1.000*
11-15 mph	51-80 ft	11-100 units/ac	*0.100*
16-25 mph	0-80 ft	11-100 units/ac	*0.100*
0-25 mph	0-80 ft	101-500 units/ac	*0.100*
0-10 mph	0-80 ft	501-1000 units/ac	*0.100*
11-15 mph	0-50 ft	501-1000 units/ac	*0.100*
11-15 mph	51-80 ft	501-1000 units/ac	*0.010*
16-25 mph	0-80 ft	501-1000 units/ac	*0.010*
0-25 mph	0-80 ft	1001+ units/ac	*0.010*

2. Press CONTRLER SETTINGS key. Set the following:

Controller Channel: This is the channel the PF will use to record the actual rate and control the rate if desired. Set to either:

Air Tank 1
Air Tank 2
Air Tank 3
Sprayer 1
Sprayer 2

NOTE: The PF will not work with channels used for planting.

3. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key.

   Target Rate Outside Field: This only pertains to using a target file.

   Set to *ZERO* if want rate outside field to be zero.

   Set to *USE LAST* if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when experiencing problems with the vehicle being falsely detected outside of the field during the outside pass.

   Set to *TGT DEFAULT* if want rate outside field to be the default rate stored in the target rate file.

   Controller Time Delay: Set to 3 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

   Actual Rate Units: Ignore this setting.

   Log Actual Rate: Set to *YES* to log actual rate to card. Set to *NO*, otherwise.

4. Exit back to main screen.

   a)Press FIELD key twice.

   b)Select appropriate field and press VIEW CONFIG key.

   c)Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active.(All other configs must be unchecked first).

d)If you will be using a target file, press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

e)Select target file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

f)Press ACCEPT key to accept field.

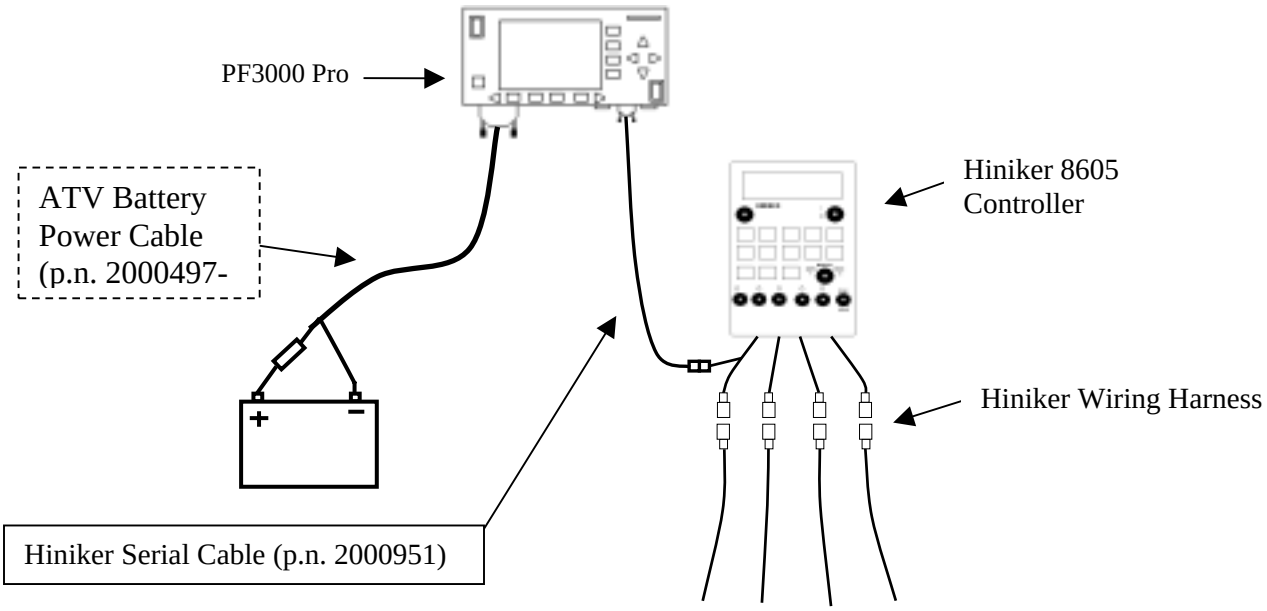
Settings on Flexcontrol

Not settings need to be made on the Flexcontrol to enable communication.

Additional Instructions

For more information on setting Target Rate, display items, creating and using .tgt prescription and logging actual rate see the Operation Section of this manual.

Cable attachment for Hiniker 8605

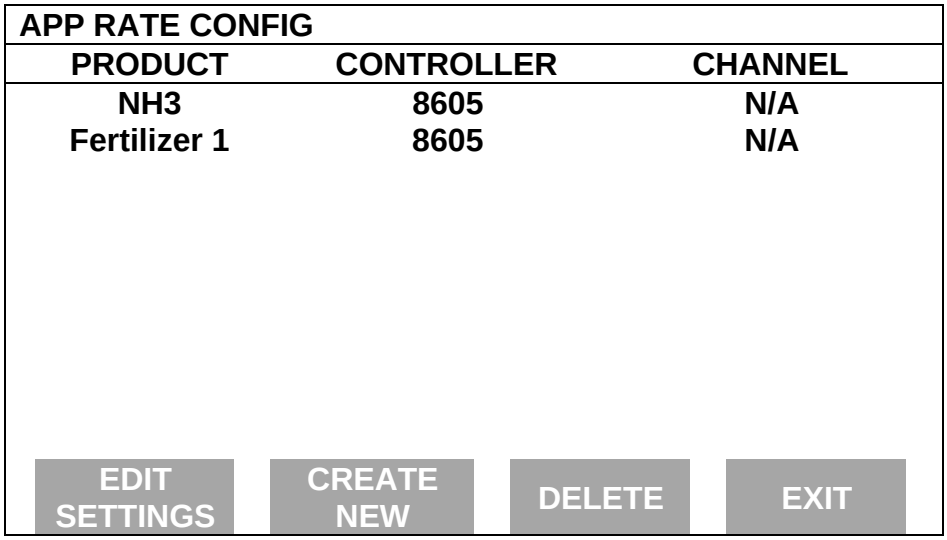


The Serial cable connecting between the PF and Hiniker 8605 enables the PF to control the rate on the Hiniker 8605. It also provides ground speed, swath width (based on number of boom sections on) and actual rate information to the PF.

Setup for Hiniker 8605 controller

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for the Hiniker 8605 controller.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear:



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to HINIKER

Controller Model: Set to 8605.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to Units/Acre of application. Set to POUNDS if applying fertilizer. Set to GALLONS if applying liquid.

Ground Speed Sensor: Set primary speed sensor to SERIAL. The monitor will get ground speed from the serial cable connection to the Hiniker 8605. Leave the secondary speed sensor set to WHEEL and do not change the Speed Sensor Pulses/100 ft. Also do not perform a distance calibration using wheel selection. No calibration is needed when primary speed is set to SERIAL.

NOTE: If you have an older Hiniker 8605 (before 2000 model year), SERIAL will not be an option if the Hiniker Software version is before 2.03 version. If so, set to GPS.

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If the boom is 20 feet behind GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Ignore setting. Swath automatically comes from serial port of the 8605 controller. The swath on the PF automatically changes as boom sections are turned ON or OFF.

Tgt Units: Contrler Units: Normally set to 1:1.0000. This ratio is used to convert the units in a target file (.tgt) to the units of application.

Example: Tgt file in pints/ac of Treflan, 8605 applies based on gallons/ac. If tank mix is 1 pint of Treflan / 10 gallon water, then set to 1:10.0000. The PF will read the pints/acre rate out of the .tgt file, multiply it by ten to convert it to gallons/ac and send that rate to the 8605 console as the rate to be applied.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0. For applying fertilizer or liquid use 1.0 or 10.0.

Actual Rate Scale Factor: Set to 1.000.

2. Press CONTRLER SETTINGS key. Set the following:

Controller Operating Mode: Set to LIQUID or NH_3, whichever the Hiniker 8605 is controlling.

3. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key.

   Target Rate Outside Field: This only pertains to using a target file.

   Set to *ZERO* if want rate outside field to be zero.

   Set to *USE LAST* if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when experiencing problems with the vehicle being falsely detected outside of the field during the outside pass.

   Set to *TGT DEFAULT* if want rate outside field to be the default rate stored in the target rate file.

   Controller Time Delay: Set to 3 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

   Actual Rate Units: Ignore this setting.

   Log Actual Rate: Set to *YES* to log actual rate to card. Set to *NO*, otherwise.

4. Exit back to main screen.

   a)Press FIELD key twice.

   b)Select appropriate field and press VIEW CONFIG key.

   c)Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active.(All other configs must be unchecked first).

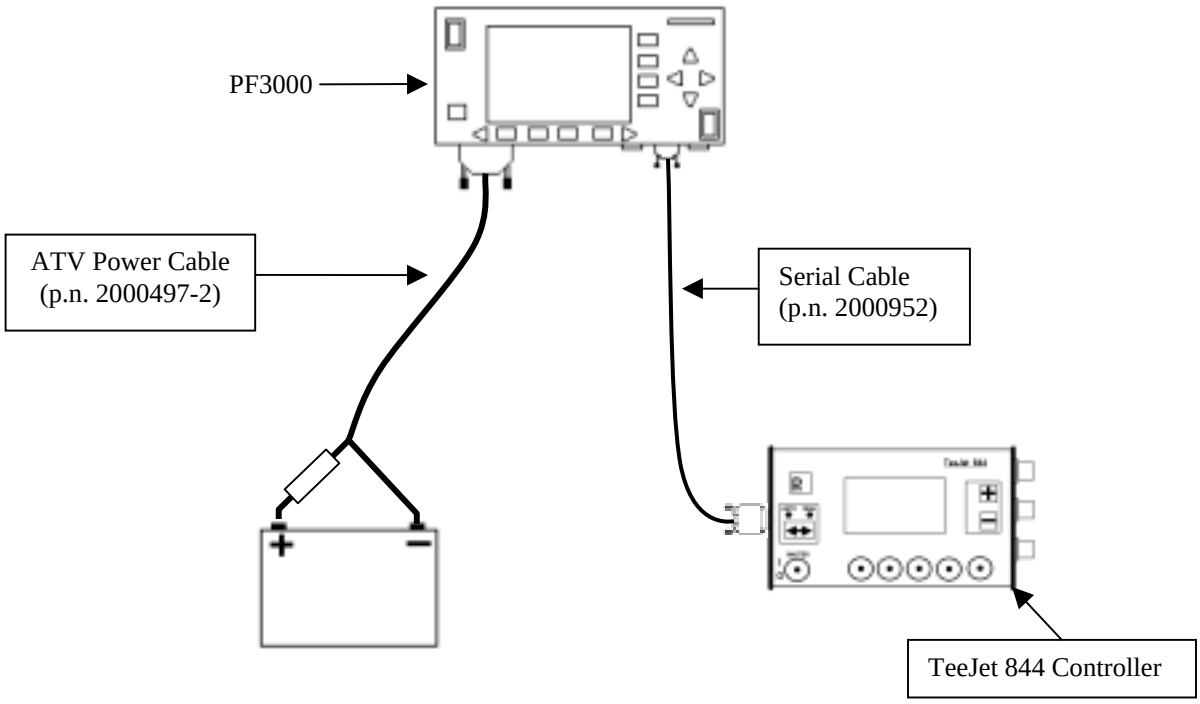
   d)If you will be using a target file, press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

   e)Select target file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

   f)Press ACCEPT key to accept field.

Settings on Hiniker 8605	Not settings need to be made on the Hiniker 8605 to establish communication.
Additional Instructions	For more information on setting Target Rate, display items, creating and using .tgt prescription files and logging actual rate see the Operations Section of this manual.

Cable attachment for Teejet 844 controller

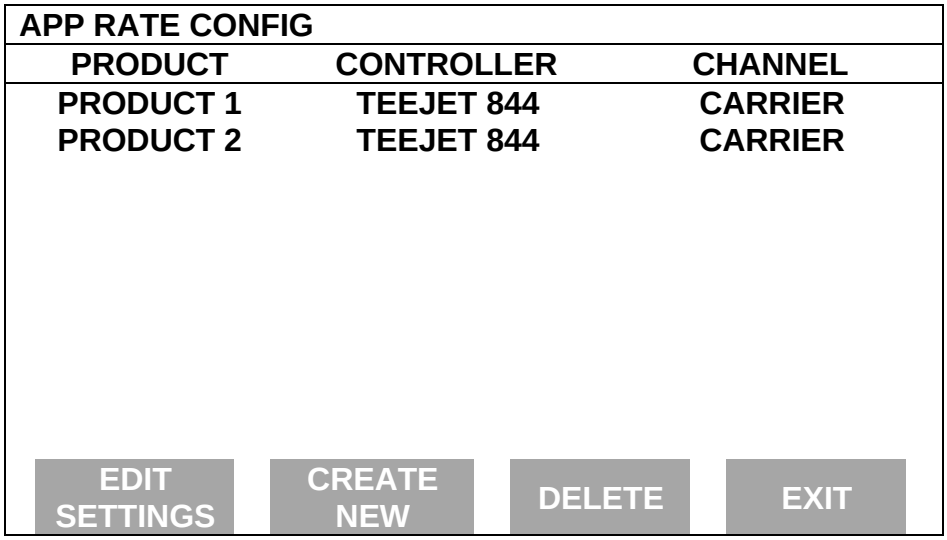


The Serial cable connection between the PF and TeeJet 844 enables the PF to control the rate on the TeeJet 844. It also provides swath width (based on the number of booms on), ground speed, actual rate and area count status (based on Master Switch) information to the PF.

Setup for Teejet 844 controller

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for the Flexcontrol controller.

1. Press SETUP key. Press APP RATE CONFIG key. A screen similar to the one below should appear:



Press CREATE NEW key to set up a new configuration or select an existing configuration and press the EDIT SETTINGS key. A new screen appears with the following settings. Select each setting and press EDIT key to change the settings.

Controller Make: Set to SPRAY SYS.

Controller Model: Set to TEEJET 844.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to Units/Acre of application. Set to POUNDS if applying fertilizer. Set to GALLONS if applying liquid.

Ground Speed Sensor: Set primary speed sensor to SERIAL. The monitor will get ground speed from the serial cable connection to the TeeJet 844. Leave the secondary speed sensor set to WHEEL and do not change the Speed Sensor Pulses/100 ft. Also do not perform a distance calibration using wheel selection. No calibration is needed when primary speed is set to SERIAL.

Note: This setting affects all configurations.

App Distance From GPS: Set to distance between where product exits applicator and position of GPS antenna on vehicle. Example: If the boom is 20 feet behid GPS antenna set to 20 feet back. Press DOWN ARROW key to set feet back, UP ARROW key to set feet forward.

Full Swath: Ignore setting. Swath automatically comes from serial port of the 844 controller. The swath on the PF automatically changes as boom sections are turned ON or OFF.

Tgt Units: Contrler Units: Normally set to 1:1.0000. This ratio is used to convert the units in a target file (.tgt) to the units of application.

Example: Tgt file in pints/ac of Treflan, TeeJet 844 applies based on gallons/ac. If tank mix is 1 pint of Treflan / 10 gallon water, then set to 1:10.0000. The PF will read the pints/acre rate out of the .tgt file, multiply it by ten to convert it to gallons/ac and send that rate to the TeeJet 844 console as the rate to be applied.

Target Rate Increment: Determines increment value by which you can change the manual target rate with each press of Up or Down arrow keys. Choices are 0.1, 1.0, 10.0, 100.0, 500.0, 1000.0, 5000.0 or 10000.0. Suggested setting when planting corn is 500.0 or 1000.0. For applying fertilizer or liquid use 1.0 or 10.0.

Actual Rate Scale Factor: This setting is required to prevent data loss in the log file (YLD file) when the units/sec of application get above 3. The rate actually applied and rate displayed on PF is unaffected by this setting. Use the chart below for setting. When the log file is mapped in Ag Leader's SMS mapping program, the mapped actual rate will be $1/10^{th}$ of the real rate if the Actual Rate Scale Factor is 0.100. If it is 0.010, the mapped actual rate will be $1/100^{th}$ the real rate. The mapped actual rate can be scaled back up in SMS. The summary actual rate is unaffected by this setting

Avg. Speed	*Swath*	*Application Rate between*	*Scale Factor*
0-25 mph	0-80 ft	0-10 units/ac	*1.000*
0-10 mph	0-80 ft	11-100 units/ac	*1.000*
11-15 mph	0-50 ft	11-100 units/ac	*1.000*
11-15 mph	51-80 ft	11-100 units/ac	*0.100*
16-25 mph	0-80 ft	11-100 units/ac	*0.100*
0-25 mph	0-80 ft	101-500 units/ac	*0.100*
0-10 mph	0-80 ft	501-1000 units/ac	*0.100*
11-15 mph	0-50 ft	501-1000 units/ac	*0.100*
11-15 mph	51-80 ft	501-1000 units/ac	*0.010*
16-25 mph	0-80 ft	501-1000 units/ac	*0.010*
0-25 mph	0-80 ft	1001+ units/ac	*0.010*

2. Press EXIT key to return to screen with ADVANCED SETTINGS key on bottom. Press the ADVANCED SETTINGS key.

Target Rate Outside Field: This only pertains to using a target file.

Set to *ZERO* if want rate outside field to be zero.

Set to *USE LAST* if want rate to be the last rate used at the time the vehicle is detected outside the field. This is useful when experiencing problems with the vehicle being falsely detected outside of the field during the outside pass.

Set to *TGT DEFAULT* if want rate outside field to be the default rate stored in the target rate file.

Controller Time Delay: Set to 3 seconds. This is delay of controller to change application equipment to new rate + 2 seconds.

Actual Rate Units: Ignore this setting.

Log Actual Rate: Set to *YES* to log actual rate to card. Set to *NO*, otherwise.

3. Exit back to main screen.

   a)Press FIELD key twice.

   b)Select appropriate field and press VIEW CONFIG key.

   c)Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active.(All other configs must be unchecked first).

   d)If you will be using a target file, press EDIT TGT FILE key, otherwise press EXIT key and skip to step f.

   e)Select target file. Press VIEW INFO key to ensure it is the correct one. After exiting view info screen, press ACCEPT key. Press EXIT key.

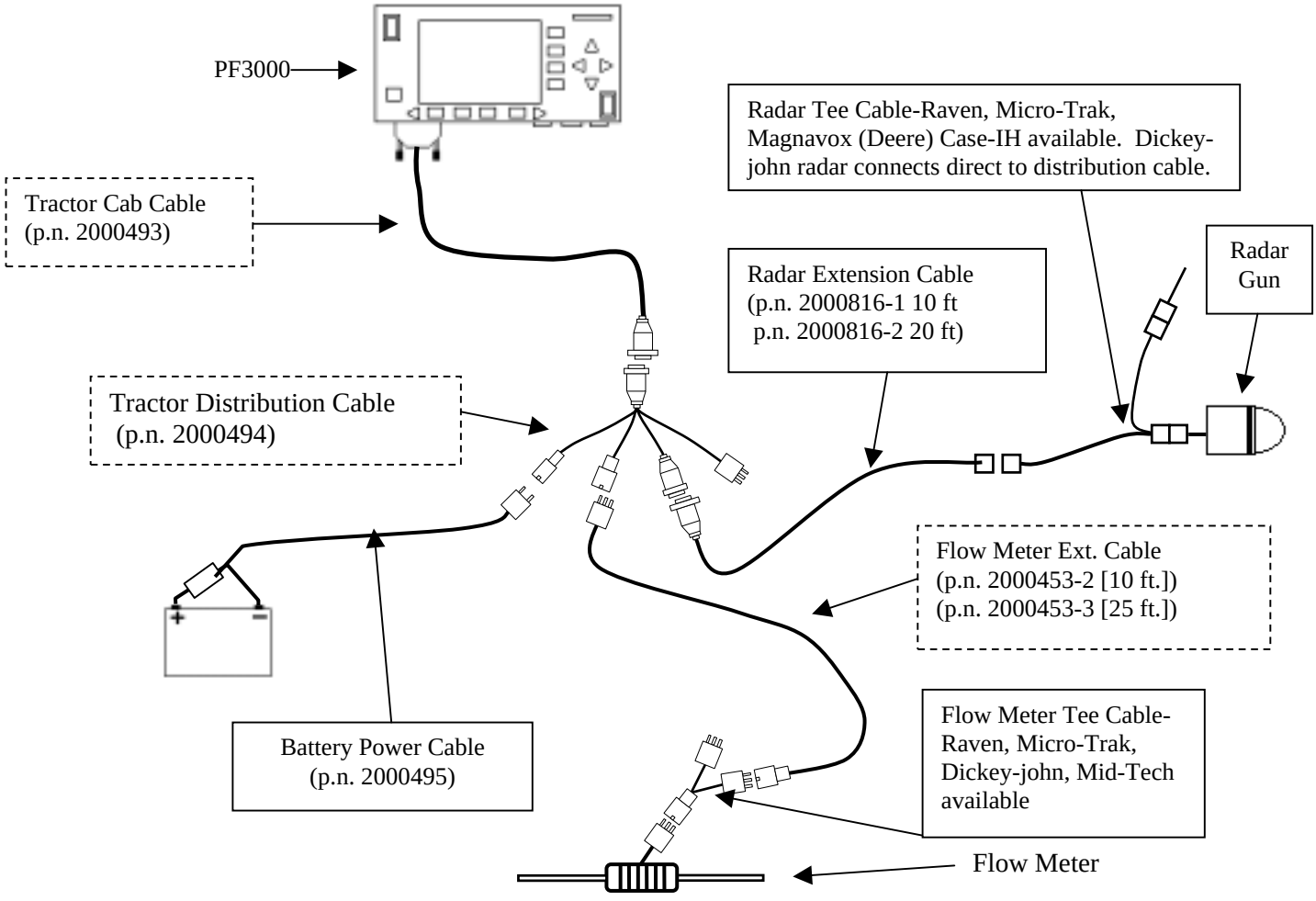
   f)Press ACCEPT key to accept field.

Cable attachment for Flow Meters

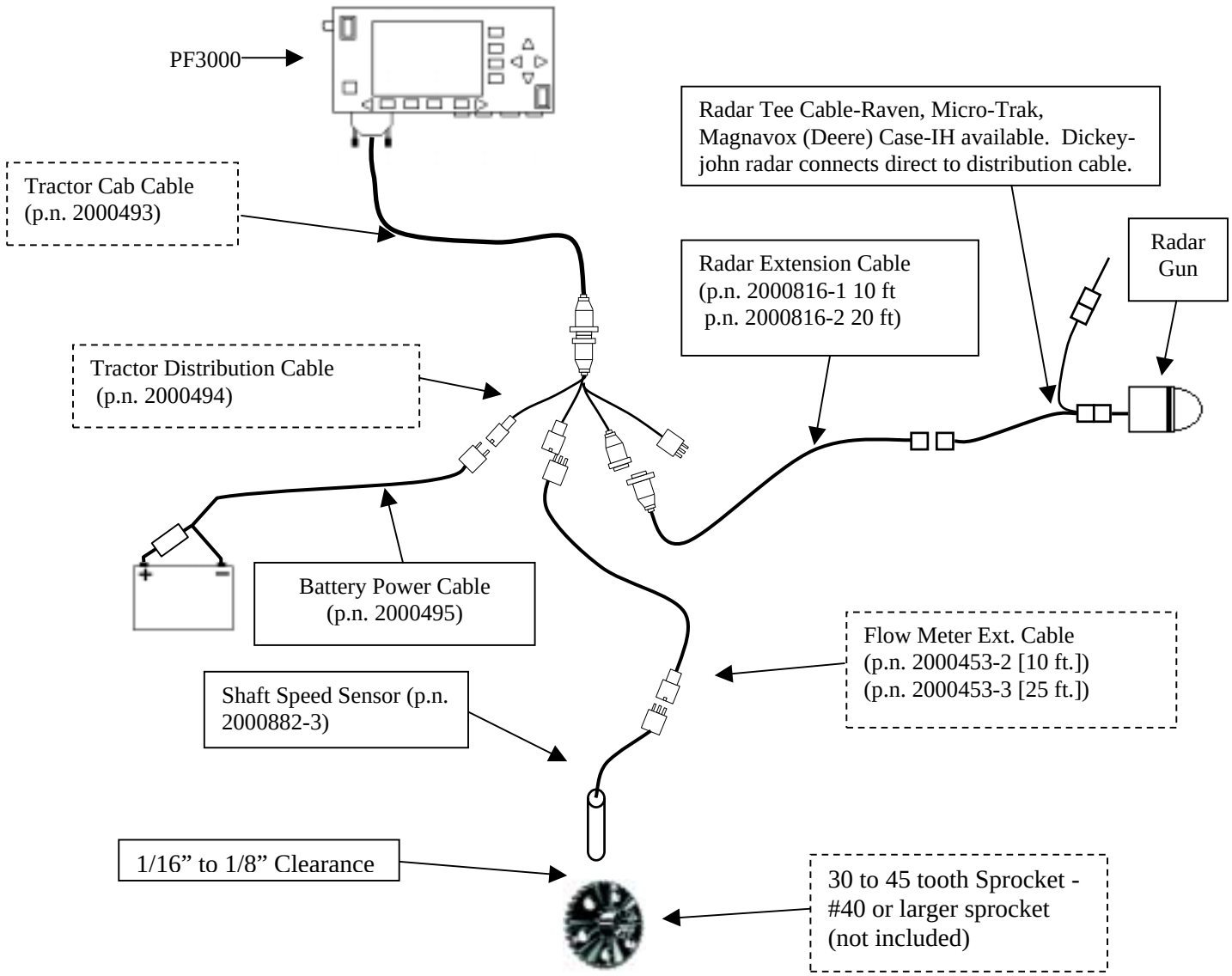
Use these instructions to connect to most flow meters to record the actual rate or as-applied rate. Some common cases where this setup should be used are:

1) Raven controllers without serial ports.
2) Hiniker 8100 or 8150 controllers.
3) Sprocket and Shaft Speed Sensor on planter.

Example of connections for a liquid flow meter



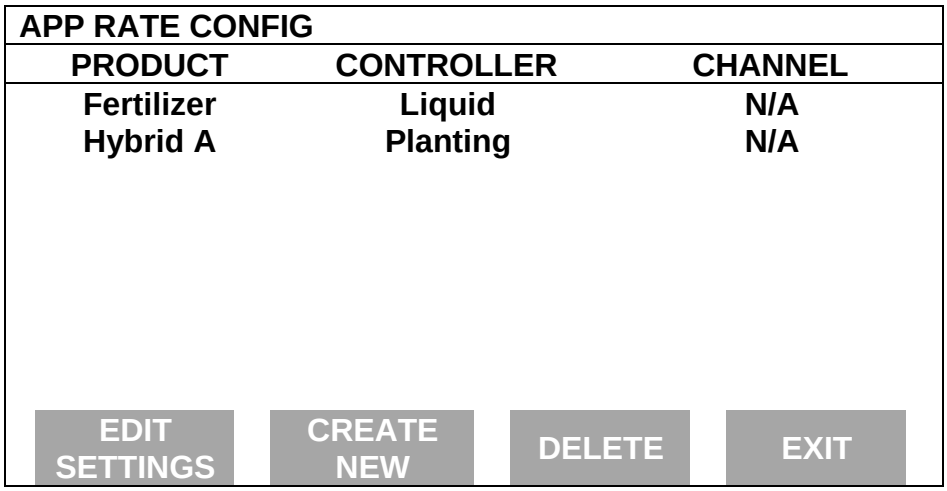
Example of connections for a sprocket and shaft speed sensor on a Planter



Setup for Flow Meter

A separate configuration of settings should be created for every product applied. A maximum of 16 different configurations can be created. The screen below illustrates two configurations set up for the Flow Meter controller.

1 Press SETUP key. Press APP RATE CONFIG key. Press CREATE NEW key. Set the following:



Controller Make: Set to *FLOWMETER.*

Controller Model: Set to *LIQUID* or *GRANULAR* or *PLANTING*, whichever bests fits the type of product and field operation.

Product: Press EDIT key. You can select an existing product and press ACCEPT key or create a new product by pressing CREATE NEW key. Press EDIT NAME key and enter name of product. Use Left or Right Arrow keys to select a character. Use Up or Down Arrow key to change the character. To erase a character in the name, highlight that character and use UP or DOWN ARROW key to scroll to the blank space between "9" and "A". Set every character and press ACCEPT key twice.

Units: Set to Units/Acre of application.

Ground Speed Sensor: Set to *RADAR* or *GPS*.

App Distance From GPS: Ignore this setting.

Tgt Units:Contrler Units: Ignore this setting.

Target Rate Increment: Ignore this setting.

Actual Rate Scale Factor: Set to 1.000.

2. Press CONTRLER SETTINGS key. Set the following:

Flowmtr pulses/gal or unit (LIQUID or GRANULAR): Enter the number of pulses per gallon or unit of flowmeter device.

NOTE: Most liquid flow meters have the number of pulses per gallon somewhere on the flow meter. Raven flow meters have the number of pulses per 10 gallons. For example if Raven Flow Meter has a number of 720, use 72 for setting.

Flowmeter pulses/10 revs (PLANTING): Set equal to the number of teeth of sprocket for shaft speed sensor times ten. Example: If sprocket has 30 teeth then setting is 300 (30 x 10 = 300)

Act rate:Flowmeter ratio (LIQUID or GRANULAR): If want to record the carrier gallons/ac set to 1.000:1. This is the typical setting.

If want to record product units/ac use following formula:

$$\frac{\text{\# product units}}{\text{1 gallon of carrier}} = \text{setting}$$

Example: $\frac{\text{.08 pint Treflan}}{\text{1 gallon of carrier}}$ = .080 (Setting is .080:1)

Number seeds/rev (PLANTING): Use the following formula to determine this setting:

$$\frac{\text{\# of seeds dispensed for 1 row}}{\text{1 rev of sprocket of sensor}} \text{ x Total \# of rows}$$

Example: 12 row planter, 6 seeds dispensed per row per one revolution of sprocket of shaft speed sensor. Setting is 72.

Area Count: Set to *Standard* if voltage from external switch goes high during operation. Set to *Reversed* if voltage from external switch goes low during operation. *Standard* is the normal setting.

3. Exit back to main screen.

    a) Press FIELD key twice.

    b) Select appropriate field and press VIEW CONFIG key.

    c) Select appropriate product/controller configuration and press ACTIVE ON/OFF key to check it as active. (All other configs must be unchecked first).

    d) Press ACCEPT key to accept field.

Additional Instructions

For more information on display items and logging the actual rate see the Operations Section of this manual.

Introduction

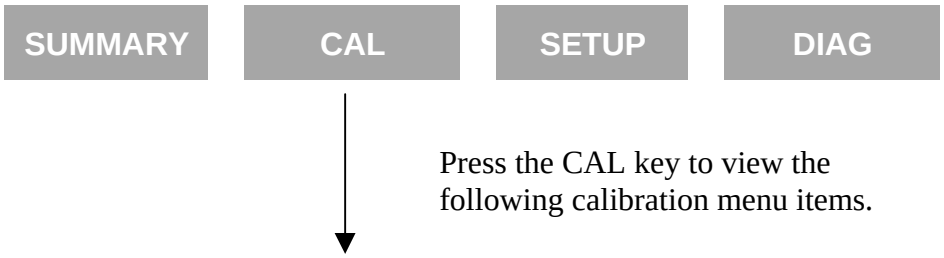
You must calibrate the monitor for it to be accurate.

The calibration section contains instructions for the following items:

Item	Operating Mode	Page
Calibrating Distance	All	3-2
Calibrating Temperature	Harvest	3-5
Calibrating for Vibration (C1)	Harvest	3-7
Calibrating Moisture	Harvest	3-9
Calibrating Grain Weight	Harvest	3-12
Calibrating Stop Height	Harvest	3-19

Order of Keys

Press the MENU key  until you see on the following on the display.



Press the bottom LEFT or RIGHT ARROW keys to switch between and view the calibration menu items

* * *

Introduction

You must calibrate distance for a primary or secondary speed setting of WHEEL, TRACK or RADAR.

Distance Calibration Screen

To view the distance calibration screen press the:

MENU key 

CAL key

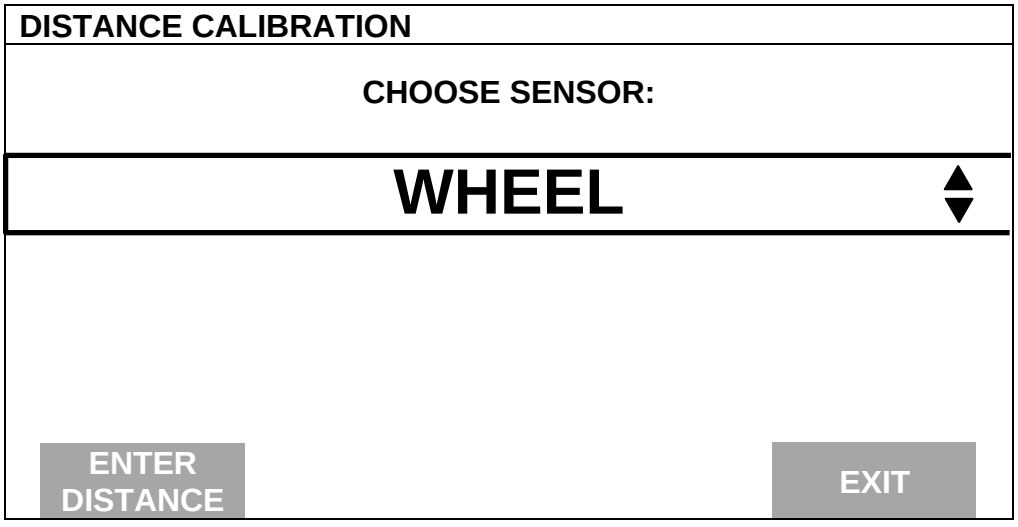
DISTANCE key

Choosing Speed Sensor

You must choose the speed sensor you are using for ground speed before you can calibrate distance. Use the UP or DOWN ARROW key to select either:

- WHEEL
- TRACK
- RADAR

Press the ENTER DISTANCE key after you have set the ground speed sensor.



Preparing to Calibrate Distance

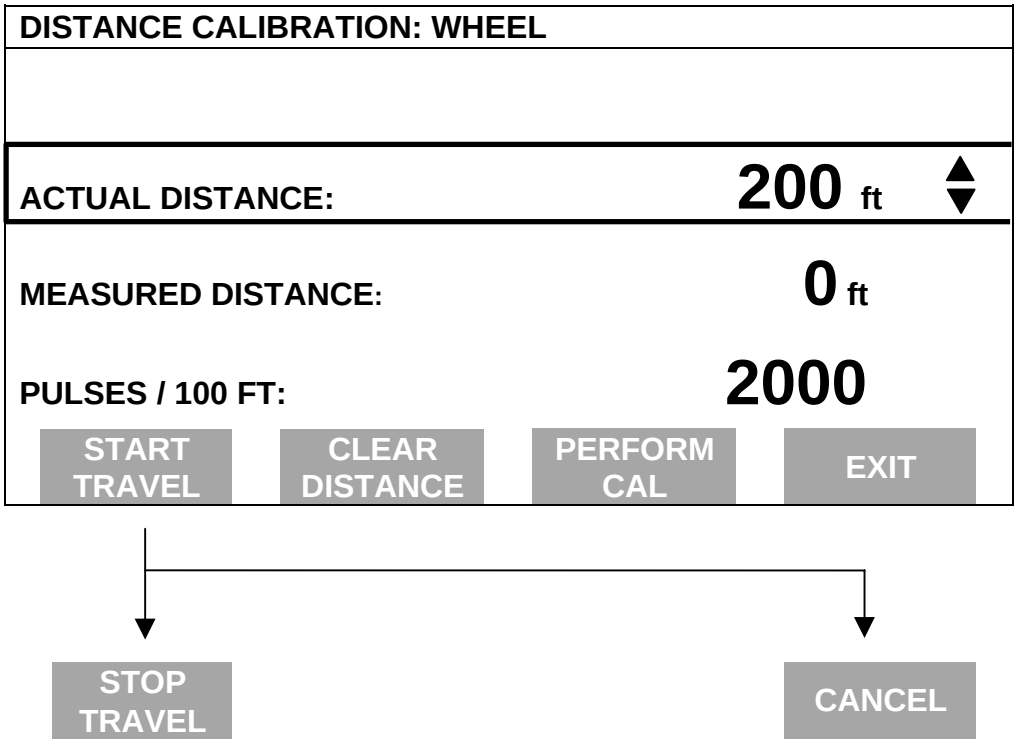
You must accurately measure a known distance, setting flags or making a mark at each end of the path.

NOTE:

- *Use at least a 200 feet travel path to obtain an accurate calibration.*
- *For maximum accuracy, calibrate on a ground surface that is similar to field conditions.*

Example of distance calibration screen:

Calibration Procedure



Step	Action
1	Use the UP or DOWN ARROW keys to set the actual distance to the known length of the travel path. *NOTE: The actual distance line must be selected (rectangular box surrounds line) before you can set the actual distance. Press the key to the right of the actual distance line to select it if it is not already selected.*
2	Position the vehicle at the beginning of the travel path. Pick a spot on the vehicle and align it with the mark at the beginning of the travel path. Press the START TRAVEL key.
3	Drive the length of the path stopping at the end marker and press the STOP TRAVEL key.
4	Press the PERFORM CAL key to calibrate the distance. Press the ACCEPT key to accept the calibration.
5	Press the CLEAR DISTANCE key and repeat steps 2-4 and drive the travel path again to double check the accuracy of the distance calibration.
6	Press the EXIT key twice after you have finished calibrating distance.

NOTE:

- *Upon pressing PERFORM CAL, the monitor automatically adjusts the "pulses / 100 ft" number so that the "Measured Distance" is equal to the "Actual Distance".*

- *You can manually change the "pulses / 100 ft" number. Select "pulses / 100 ft" by pressing the key to the right of the line. Then use the UP or DOWN ARROW keys to set the number. Do not change this number after calibrating.*

* * *

Introduction

The moisture sensor contains a temperature sensor, which measures the grain temperature for use in adjusting the measured grain moisture. You must have the moisture sensor installed in the combine before you can calibrate temperature.

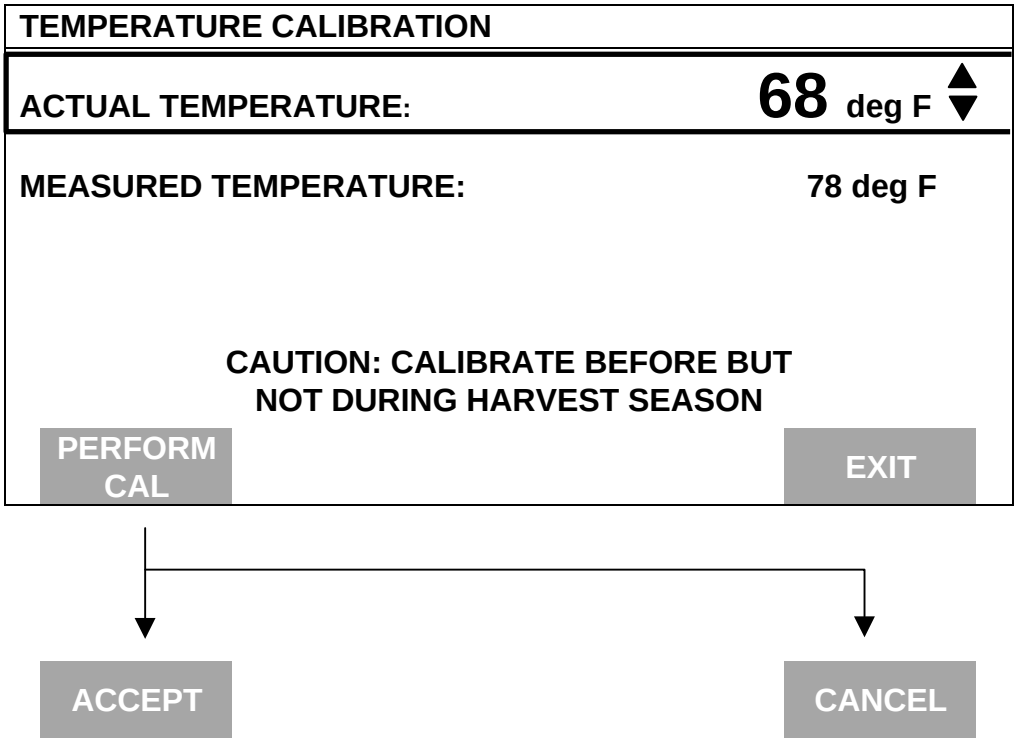
Temperature Calibration Screen

To view the temperature calibration screen press the:

MENU key
CAL key
TEMP key

Example of temperature calibration screen:

Calibration Procedure



Step	Action
1	Use the UP or DOWN ARROW keys to set the actual temperature.
2	Press the PERFORM CAL key to calibrate the temperature.
3	Press the ACCEPT key to accept the calibration.
4	Press the EXIT key once you have finished.

NOTE:

- *For accurate moisture readings, it is more important that you **not** change the temperature calibration while harvesting than it is to have it set exactly right. Therefore, after you set it, leave it at that setting.*

- *It is best to calibrate the temperature when the combine has been sitting in a constant temperature for several hours. If the combine has sat overnight, the moisture sensor may be cooler than the air temperature because the air can warm much more quickly than the sheet metal of the combine.*

- *Upon pressing PERFORM CAL, the monitor automatically adjusts the "Temperature Offset" number so that the "Measured Temperature" is equal to the "Actual Temperature".*

* * *

Introduction

The PF3000 must be calibrated to eliminate false grain flow readings that are caused by vibration forces when the combine runs empty.

Vibration Calibration Screen

To view the vibration calibration screen press the:

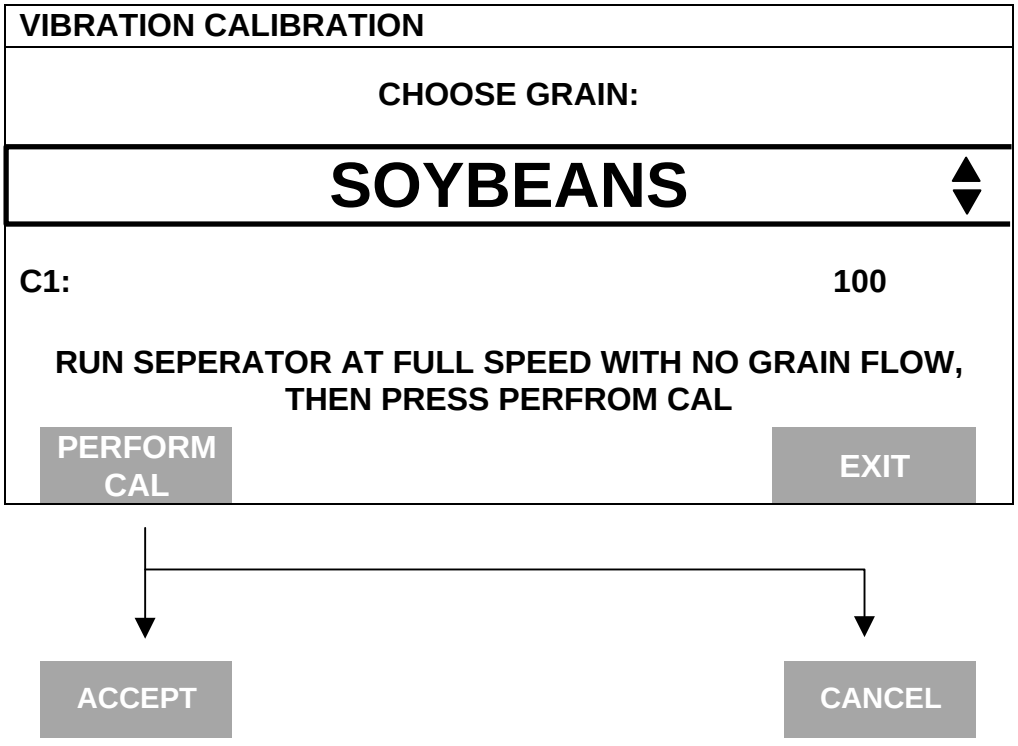
MENU key 

CAL key

bottom RIGHT ARROW key

VIBRAT key

Calibration Procedure



Step	Action
1	Use the UP or DOWN ARROW keys to choose the grain type.
2	Engage the separator and run it all full engine speed with no grain flow. Press the PERFORM CAL key.
3	After the monitor counts down 60 seconds, a number for C1 is displayed. Press the ACCEPT key. *NOTE: C1 should be between 0 and 250.*
4	Press the EXIT key once you have finished calibrating for vibration.

NOTE: You should have the head that you will use to harvest the grain on the combine before you perform a vibration calibration for any grain.

* * *

Important Notes

- You must calibrate the monitor for grain moisture for each grain type before the monitor can accurately measure grain moisture.
- Make sure the temperature has been properly calibrated before calibrating moisture.
- You do not have to calibrate for grain moisture at the beginning of the season to get accurate results, although it is recommended. Once calibrated, the monitor will automatically correct all grain moistures for all the loads that were previously harvested of that grain.

Actual Moisture

To calibrate moisture, you must obtain an actual moisture for only one load of the grain you want to calibrate.

Ideally the load should be one to two combine hoppers of grain that varies little in moisture content.

Use a reference moisture sensor and take readings from several grain samples from the load.

CAUTION: To prevent death or serious injury to you or others do NOT enter the grain tank when the separator is running.

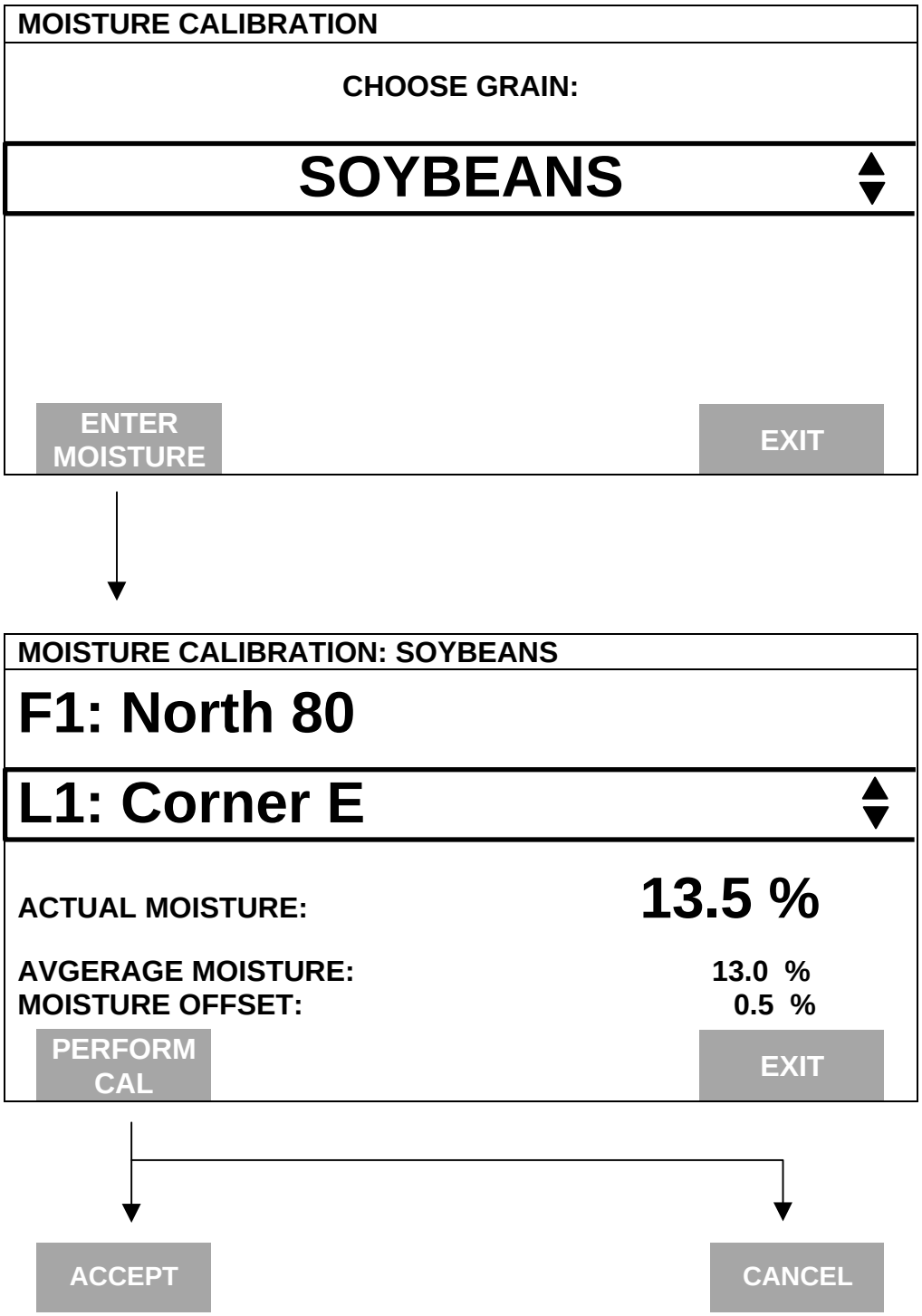
NOTE: Make sure the moisture sensor does not have a buildup of sticky material on it (this can be a problem with soybeans) when you are harvesting the moisture calibration load. You will know there is buildup if your moisture is reading 8-10 or more percentage points too high.

Moisture Calibration Screen

To view the moisture calibration screen press the:

MENU key
CAL key
MOISTURE key

Calibration Procedure



Step	Action
1	Use the UP or DOWN ARROW keys to set the grain. Press the ENTER MOISTURE key.
2	Refer to the next screen and change the load (and field if necessary) to the load that has an actual moisture. Use the UP or DOWN ARROW keys to change the field or load, depending on which is selected. You must have either the field or load line selected (rectangular box surrounds line) before you can change a field or load. To select either field or load, press the key to the right of the field or load line.
3	Press the key to right of the "Actual Moisture" line to select that line.
4	Use the UP or DOWN ARROW keys and enter the actual moisture for the load.
5	Press the PERFORM CAL key. Press the ACCEPT key.
6	Press the EXIT key once you have finished.

NOTE:

- *Upon pressing PERFORM CAL, the monitor automatically adjusts the "Moisture Offset" number so that the "Average Moisture" is equal to the "Actual Moisture".*

- *Every time you calibrate moisture, the monitor will adjust the moisture for all of that grain's loads.*

* * *

Before You Begin

Calibrate the moisture before calibrating grain weight. Refer to the instructions in this section for moisture calibration.

You must calibrate the monitor for grain weight (lbs) for each grain type before the monitor will accurately measure bushels. You should be able to calibrate the PF3000 for grain weight to an average error of 1 percent to 3 percent.

IMPORTANT: Before calibrating, you MUST check the clearance between the tip of the clean grain elevator paddles and the inside of the elevator housing at the top of the clean grain elevator. **There must be ½ inch or less clearance as the paddle rotates around the top sprocket**.

You do not have to calibrate grain weight at the beginning of the season to get accurate results, although it is recommended. Each time you calibrate the monitor, it will automatically correct all grain weights for all the loads of that grain type that were previously harvested.

NOTE: Because the monitor measures the weight, not the volume, of the grain hitting the flow sensor, test weight and different varieties should not cause calibration inaccuracies.

Harvesting Calibration Loads

The monitor calibrates itself on the basis of actual load weights you enter into the monitor. You obtain actual load weights by weighing the grain of a load in the monitor on accurate scales (elevator, **calibrated** weigh wagon).

IMPORTANT: For accurate calibration results, you must obtain at least six calibration loads (loads with actual weights). Each calibration load must be harvested under a different grain flow rate by varying either your travel speed or your swath width.

To vary the grain flow rate you should either vary the travel speed or swath width for each calibration load.

> *NOTE: Varying travel speed and swath width are not necessary for grass seed harvest.*

Carefully follow these directions when harvesting your calibration loads.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>With the combine stopped, the combine grain tank empty, and a hauling vehicle empty, set the monitor on a load that does not have any data. Make sure the load is set on the correct grain.</td></tr>
<tr><td>2</td><td>Decide the speed at which you will drive or the swath width you will use for this load to vary the grain flow rate going through your combine. Try to keep your speed or swath width as constant as possible for the entire load.

Example calibration loads (Ld) with varying speed (S) or swath width (SW):
<table>
<tr><th></th><th>Ld 1</th><th>Ld 2</th><th>Ld 3</th><th>Ld 4</th><th>Ld 5</th><th>Ld 6</th></tr>
<tr><td>S (mph)</td><td>5.0</td><td>4.5</td><td>4.0</td><td>3.5</td><td>3.0</td><td>2.5</td></tr>
<tr><td>SW (rows)</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
</table></td></tr>
<tr><td>3</td><td>Harvest grain into the calibration load in the monitor.

NOTE: Harvest 3,000 or more lbs for calibration loads.</td></tr>
<tr><td>4</td><td>Unload one or more times into the hauling vehicle, finishing with the following:
Combine grain tank again empty
All the grain from the calibration load on the hauling vehicle
No grain from any other combine on the hauling vehicle</td></tr>
<tr><td>5</td><td>Immediately change to another load that does not have any data.</td></tr>
<tr><td>6</td><td>Weigh the grain on the hauling vehicle and record the actual load weight on a log sheet in the back of this section of the manual.

NOTE: If you are using a weigh wagon to weigh the grain, make sure the wagon has been calibrated properly.</td></tr>
<tr><td>7</td><td>Repeat the above steps and harvest another calibration load. You can also enter an actual weight and calibrate as you obtain each actual weight.</td></tr>
</table>

Grain Weight Calibration Screen

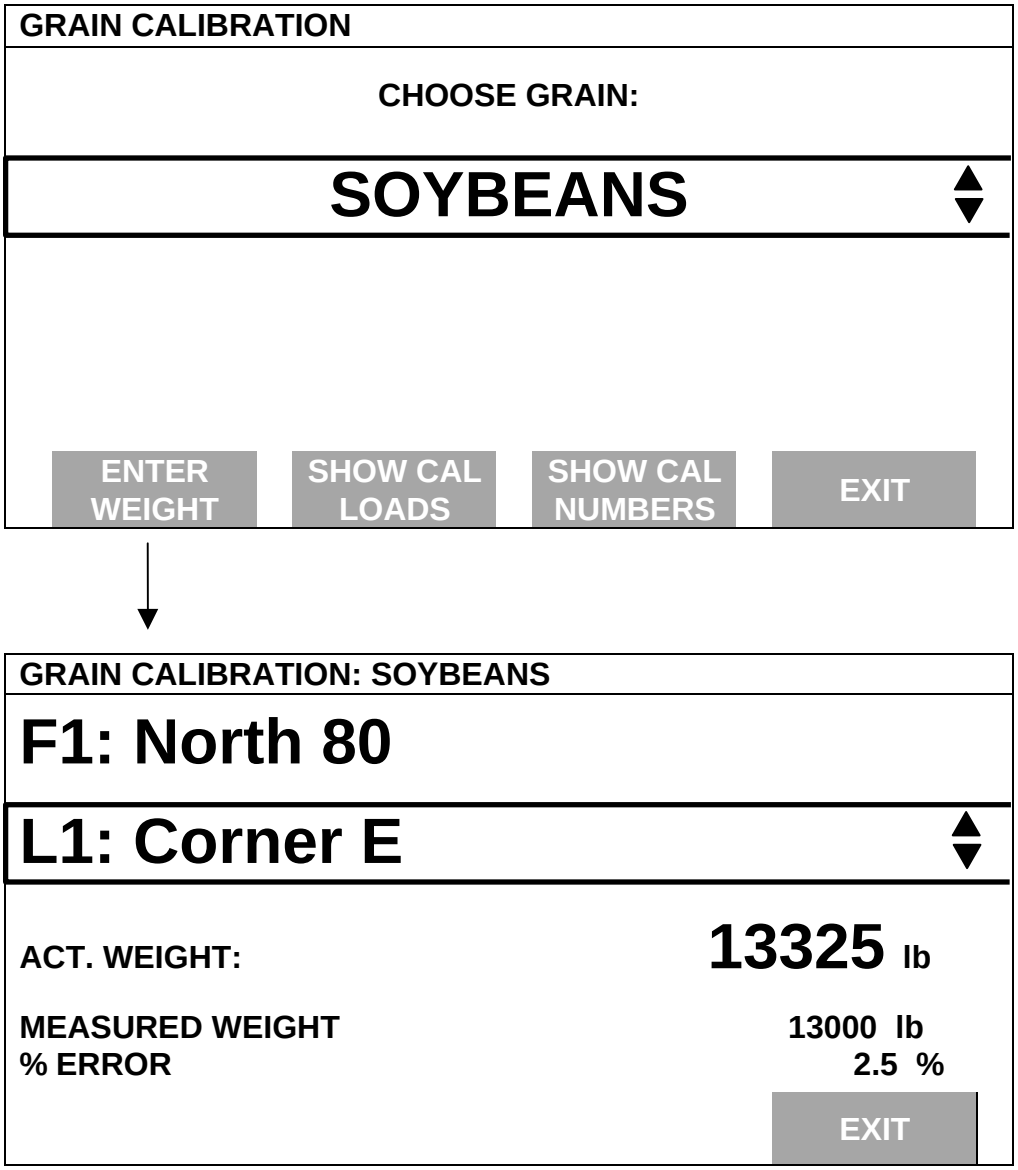
To view the weight calibration screen press the:

MENU key 

CAL key

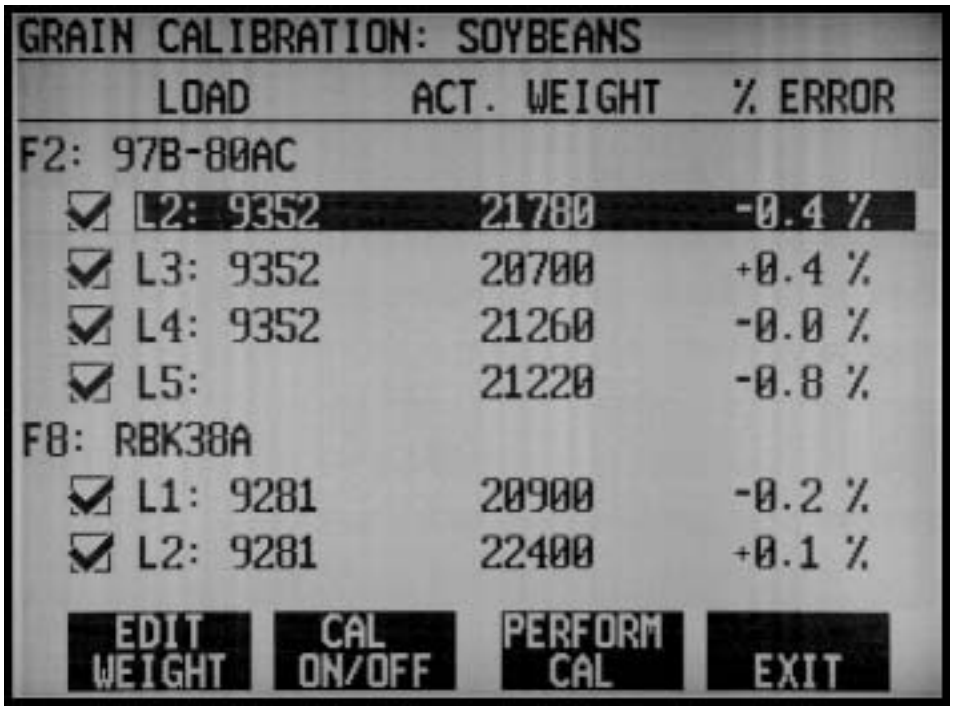
WEIGHT key

Calibration Procedure



Step	Action
1	Use the UP or DOWN ARROW keys to set the grain. Press the ENTER WEIGHT key.
2	Refer to the next screen and change the load (and field if necessary) to a load for which you want to enter an actual weight. Use the UP or DOWN ARROW keys to change the field or load, depending on which is selected. You must have the field or load line selected (rectangular box surrounds line) before you can change a field or load. To select either field or load, press the key to the right of the field or load line.
3	Press the key to right of the "Act. Weight" line to select that line.
4	Use the UP or DOWN ARROW keys and enter the actual weight for the load. Press the ACCEPT key.
5	Repeat steps 2-4, and enter all the actual weights for all the calibration loads.
6	Press the EXIT key once you have finished to return to the screen where you selected the grain.
7	Press the SHOW CAL LOADS key to view the screen below.

Example of calibration loads screen:



<table>
<tr><th>Step</th><th colspan="2">Action</th></tr>
<tr><td>8</td><td colspan="2">Press the PERFORM CAL key to start the calibration. The monitor will start calibrating and then it will stop and display “Fast Calibration Complete”.</td></tr>
<tr><td rowspan="4">9</td><td>If the…</td><td>Then…</td></tr>
<tr><td>Maximum error is <u>more</u> than +/- 15 %</td><td>Press the CANCEL key to stop the calibration and view the calibration loads again. Select the load with the highest error over +/- 15 % and press the CAL ON/OFF key to uncheck the load and eliminate it as a calibration load. Press the PERFORM CAL key again to restart the calibration.</td></tr>
<tr><td>Maximum error is <u>less</u> than +/- 15 %</td><td>Press the ACCEPT key.</td></tr>
<tr><td colspan="2">NOTE: The calibration error is the percent difference between the actual weight and the estimated weight. The maximum error is the error of the calibration load that has the highest error.

Example:
Actual weight: 10,000 Lbs.
Estimated weight: 10,100 Lbs.
Error: + 1 %</td></tr>
<tr><td rowspan="3">10</td><td colspan="2">After pressing the ACCEPT key in step 9, the monitor will do the following:</td></tr>
<tr><td>If you have...</td><td>Then...</td></tr>
<tr><td>Four or more calibration loads</td><td>The monitor will continue to calibrate reducing the calibration errors. Press the EXIT key to view the calibration loads and the calibration errors.</td></tr>
<tr><td>Less than four calibration loads</td><td>The monitor is finished calibrating and will display the calibration loads and their errors again.</td></tr>
</table>

Step	Action
11	**Good Calibration Results:** If you have four or more calibration loads for grain or one to three calibration loads, your goal after completing a calibration should be to achieve an **average error of 1 percent to 3 percent and a maximum error of 3 percent to 5 percent**. If you have less than four calibration loads, the calibration errors may be slightly higher than if you had four or more calibration loads. If you find loads with high calibration errors after completing a calibration, you should remove the loads as calibration loads by pressing the CAL ON/OFF key. Press the PERFORM CAL key again to restart the calibration. Once you are satisfied with your calibration results, press the EXIT key until you return to the main operating screen.

Reasons for high calibration errors on loads

- Grain type set incorrect for the load
- Moisture is incorrect for the load
- Actual pounds value is not correct
- Grain weighed is not the same amount of grain that was harvested into the load (for example: combine or wagon tank not empty before starting load or forgot to change loads and added more grain into load after grain weighed)
- Did not have 1/2 inch clearance between paddles and elevator housing at top of elevator
- Installation problem with deflector plate or flow sensor
- Elevator speed is erratic

Recalibrating the Monitor

You can add or eliminate a calibration load and recalibrate the monitor any time to improve the monitor's calibration accuracy. If you have not achieved satisfactory calibration results after entering 10 to 15 calibration loads (with varied flow rates) something is wrong. Refer to the troubleshooting section instead of adding more actual weights.

Periodic Checks for Accuracy

You should occasionally check the monitor for calibration accuracy throughout the season by weighing a monitor load of grain. If you find the monitor is not accurate, enter that actual weight into the monitor and calibrate the monitor again.

NOTE: If you do not vary your flow rates while harvesting your initial calibration loads, later in the season you may find the monitor is not accurate because you are harvesting at a different grain flow rate than for what you have calibrated. Entering one or two more calibration loads at that grain flow rate will improve your accuracy.

Adjusting for Chain Slack

If you adjust for slack in your clean grain elevator chain during the season, make sure that you use the lower adjuster. If you move the top shaft of the grain elevator, your calibration will be inaccurate and you will have to enter all new calibration loads.

C Numbers

The 11 C Numbers, C1 through C11 determine the pounds that the monitor calculates. You can display the C numbers by pressing the SHOW CAL NUMBERS key at the grain weight calibration screen where you choose the grain.

IMPORTANT: Do not change the C numbers after you have calibrated.

The C numbers **initially** should be set to the same values that appear on your initial calibration sheet (refer to the setup section), but they will change and become more accurate after you have calibrated.

* * *

Introduction

The stop height is the height at which the head must be raised at the end of a pass to shut off area counting. The stop height number is a reference number for the monitor to determine the height of the head. It does not pertain to feet or inches of height.

The stop height number must be set for each grain type.

You must have the monitor installed in the combine to set the stop height.

Stop Height Calibration Screen

To view the stop height calibration screen press the:

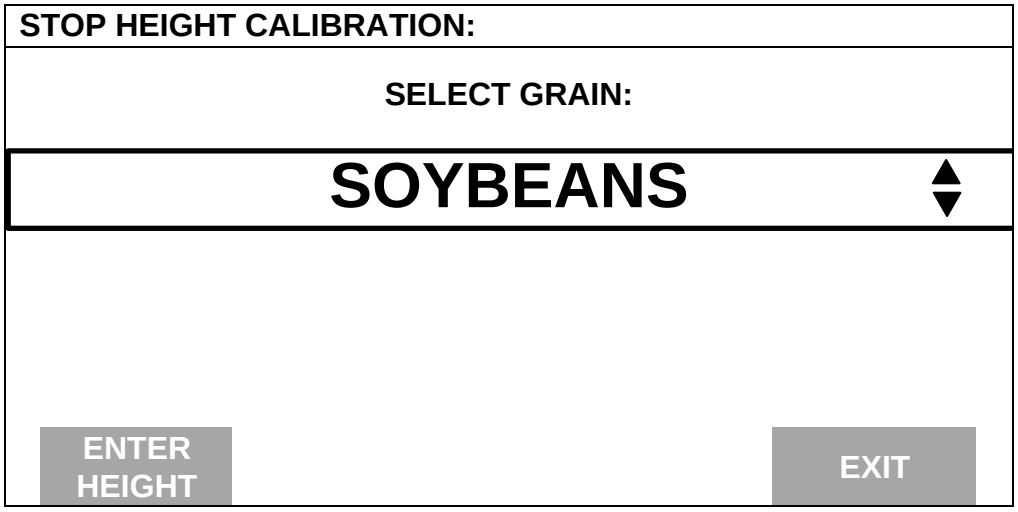
MENU key 

CAL key

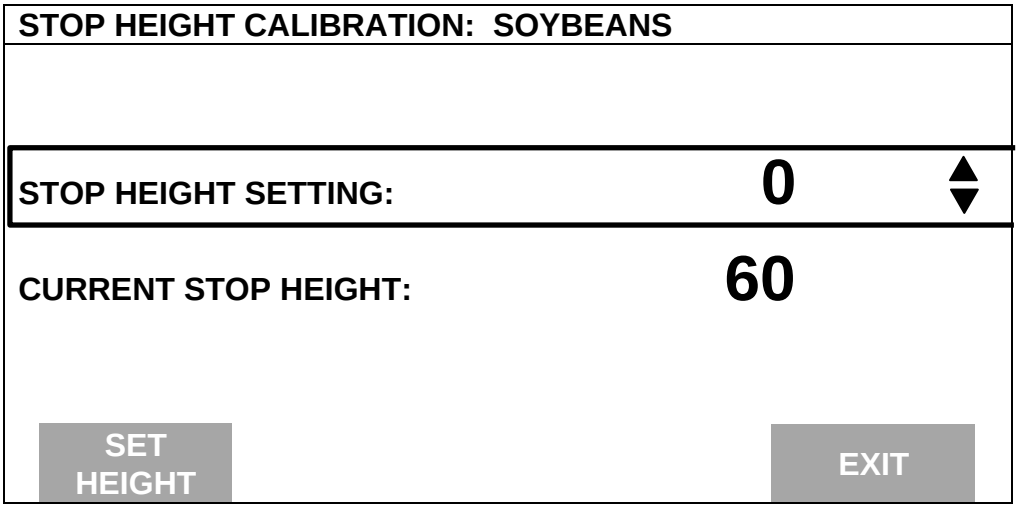
bottom RIGHT ARROW key

STOP HGT key

Calibration Procedure



Step	Action
1	Use the UP or DOWN ARROW keys to select the grain.
2	Press the ENTER HEIGHT key.



Step	Action
3	Move the combine head to the height at which you want the monitor to stop counting area.
4	Press the SET HEIGHT key. The monitor will automatically set the stop height setting equal to the current stop height. Press the ACCEPT key.
5	Press the EXIT key twice to return to the main operating screen.

NOTE: You can manually adjust the stop height number by pressing the UP or DOWN ARROW key when the screen above is displayed.

* * *

Log Sheet

Field		Load					Actual	%	Indicated	Dry		Dry	
#	Name	#	Name	Crop	Variety	Date	Lbs	Moist	Lbs	Bu	Acres	Yield	Comments

Field		Load					Actual	%	Indicated	Dry		Dry	
#	Name	#	Name	Crop	Variety	Date	Lbs	Moist	Lbs	Bu	Acres	Yield	Comments

Log Sheet

Field		Load					Actual	%	Indicated	Dry		Dry	
#	Name	#	Name	Crop	Variety	Date	Lbs	Moist	Lbs	Bu	Acres	Yield	Comments

Field		Load					Actual	%	Indicated	Dry		Dry	
#	Name	#	Name	Crop	Variety	Date	Lbs	Moist	Lbs	Bu	Acres	Yield	Comments

Important Notices

The PF3000 must be properly setup and calibrated. Carefully read and follow the directions in the setup and calibration section before using the PF3000.

Section Contents

This section contains instructions for the following items. The operating modes that the instructions pertain to are also listed.

Item	Operating Mode	Page
Fields and Loads	All	4-2
On Screen Map	All	4-4
Area Counting	All	4-6
Memory	All	4-10
Marking	All	4-12
Logging Map Data to a Card	All	4-14
Using a GPS Receiver	All	4-18
Using a Radar Gun	All	4-19
Diagnostic	All	4-21
Display Items	Harvest	4-24
Summary	Harvest	4-28
Moisture Setting	Harvest	4-32
Swath Setting	Harvest	4-33
Grain Type	Harvest	4-34
Load Settings	Harvest	4-35
Site Verification	Site Verification	4-37
Application Rate – Monitor and Control	Application Rate	4-39
Display Items	Application Rate	4-44
Printing Field/Load Summary	Harvest	4-47
Checking Data Accuracy-End of Season	Harvest	4-62
Updating Operating Program	All	4-66
Navigate	All	4-69
Boundary	All	4-74
Gridding	Site Verification	4-77
***		

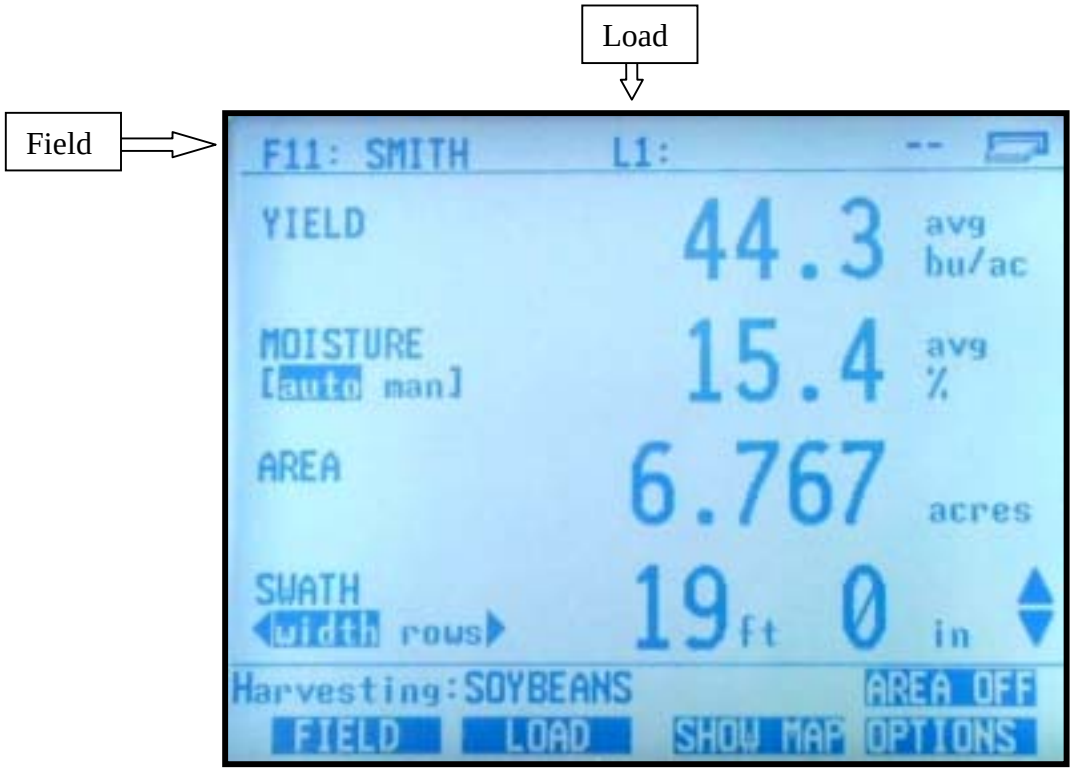
Recommendations

All the information recorded by the PF3000 must be recorded in a field and load. The field and load that the monitor is set on is found on the top line of the main operating screen.

Fields
You should at least create all the fields and name them before you begin to use the PF3000. The monitor will use the same set of fields you create for each operating mode (harvest mode, application rate mode, site verification mode) of the monitor. You can create and name your fields using any operating mode. You should choose field names that you can use year after year.

Loads
It also recommended to create and name loads within fields before you use the PF3000. Each operating mode of the PF3000 will have its own set of loads for each field (except, currently site verification loads are the same as harvest loads).

Definition:
Load: A load is used to subdivide a field into smaller sections. The monitor load is not associated with the combine tank, wagon, or truck load.



Creating/Naming Fields and Loads

Instructions for creating and naming fields and loads are in the setup section.

Changing Fields and Loads

A small set of up or down arrows will appear to the left of either the field or load indicating which one can be changed by pressing the UP or DOWN ARROW keys.

Changing Field

If the small arrows are not displayed to the left of the field, press the FIELD key to display field alone on the top display line and make the small arrows appear beside the field. Press the UP or DOWN ARROW keys to scroll through the fields. Press the ACCEPT key to change to a different field.

Changing Load

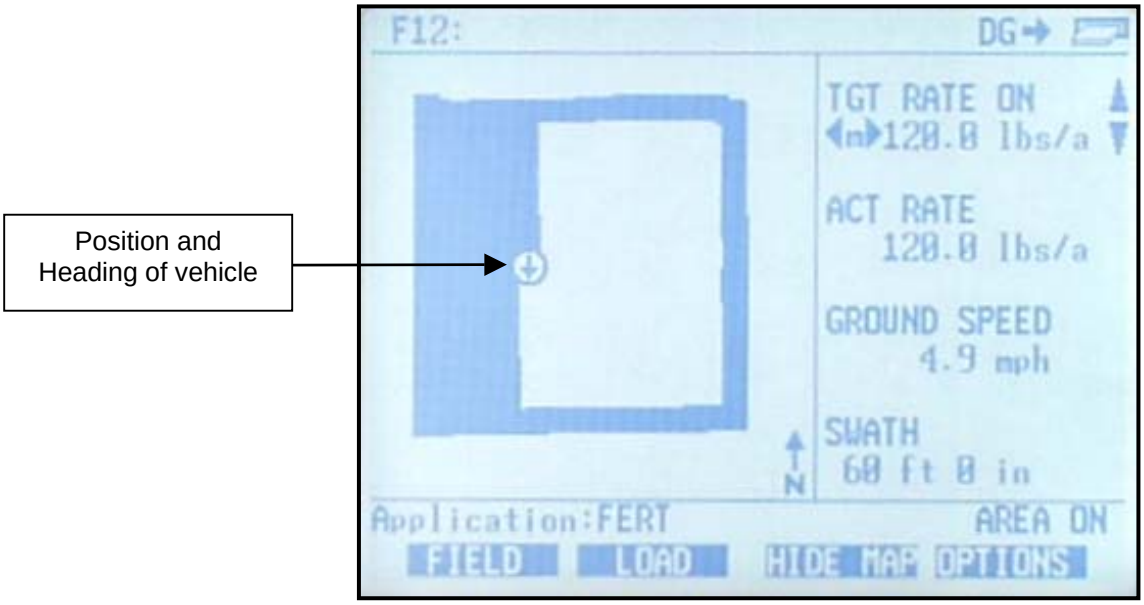
If the small arrows are not displayed to the left of the load, press the LOAD key to make the small arrows appear beside the load. Press the UP or DOWN ARROW keys to scroll through the loads. Press the ACCEPT key to change to the different load.

* * *

On Screen Map

The PF 3000 mapping screen will display a coverage map based on the swath width and path traveled by the vehicle. The monitor makes one coverage map for the GPS data logged for each field in each operating mode.

The On Screen Map can be used to identify missed passes and verify data collection. It does not have enough resolution to show small uncovered areas between passes.



Example of Coverage Map

PF Coverage Files (PFC files)

The PFC file is used to store each coverage map made by the PF3000. The data is stored on a memory card that is in the monitor at the time the file is created. The PFC file will not be read or created by anything other than a PF model monitor. It will always be 20 kb in size regardless of field size.

The field and operating mode of the PFC file is identified in the file name. The format is shown below:

MMMMFNNN.pfc where Mode is abbreviated as M, Field is abbreviated as F and field number is abbreviated as N.

The abbreviations for each mode and an example of file names are shown below:

Grain Harvest – Harv	HarvF123.pfc
Grass Harvest – Gras	GrasF123.pfc
HarvestMaster – Hmas	HmasF123.pfc
Cotton Harvest – Cotn	CotnF123.pfc
Application Rate – AppR	AppRF123.pfc
Site Verification – Site	SiteF123.pfc

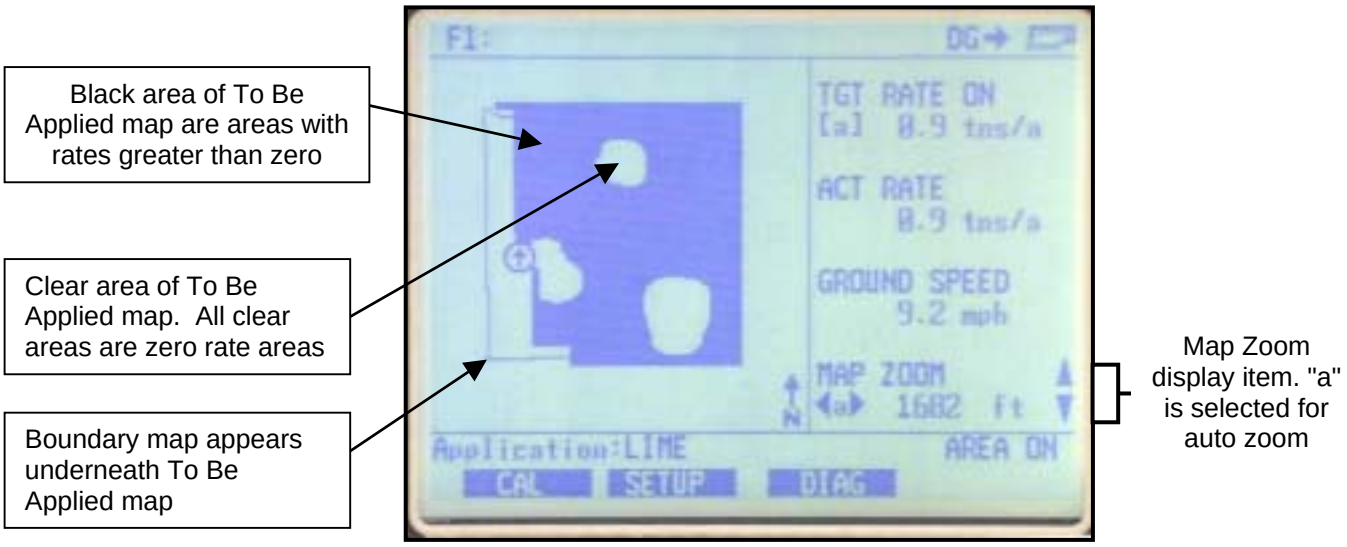
When switching memory cards, if you want to view the coverage maps of already covered fields, you must copy the PFC files to the new card. If you do a second field operation using the same operating mode in the same year, you must erase the original coverage file for that field if it is on the card.

Making and Showing the Map

Press the SHOW MAP key to view the map and HIDE MAP key to hide the map. If there is no pre-existing PFC file for the field for the operating mode, a new coverage map will draw in if the Coverage Map setting is turned on and there is a GPS signal and the monitor is logging data to the card. If there is an existing PFC file on the memory card for that field, that coverage map will appear. Press SETUP key and MAP key to view or change the Map Settings.

NOTE: When Target Map is on and a prescription file is set, all areas with prescription rates greater than zero are shown as black. All clear areas on the map have a rate of zero. The black areas will erase as the field is covered. This map shows all parts of the field that require application.

Setting	Setting Options	Default	Comments
Coverage Map	ON, OFF	ON	**ON** – enables reading/writing of PFC coverage file and displaying coverage map. **OFF** – prevents reading/writing of PFCcoverage files and displaying coverage map
Boundary Map	ON, OFF	ON	**ON** – enables reading and mapping BDY boundary files **OFF** – prevents reading and mapping BDY boundary files
Target Map	ON, OFF	ON	This setting is only displayed in Application Rate Mode. **ON** –this enables a "To Be Applied" map based on the tgt prescription file to appear instead of the coverage map. If this setting is ON and there is no tgt prescription file set, the coverage map will draw in as black as the field is covered. **OFF** – prevents showing a "To Be Applied" map. Coverage map data is displayed as black.



Example of To Be Applied map erasing as field is covered

Map Zoom

This option will allow you to manually or automatically zoom in or out. The scale of the map is the distance in feet or meters represented by each side of the screen. Using the automatic function displayed as "a" allows the monitor to automatically scale and display the map on screen to the fullest extent possible. The manual function displayed as "m" allows the user to manually zoom in or out by setting the scale of the map.

Display "Map Zoom" on the main screen:

Step	Action
1	If the arrow symbols are not displayed in the Map Zoom display line, highlight the MAP ZOOM display by pressing the Display Selection key.
2	Press the RIGHT ARROW key to select "m" for manual zoom.
3	Press the UP ARROW key to zoom out and DOWN ARROW key to zoom in.
4	Press LEFT ARROW key to select "a" for automatic zoom.

* * *

Introduction

In the bottom right corner of the display, the monitor always displays either:

- AREA ON
  or
- AREA OFF

The area count switch is located on the bottom right corner of the front panel. The switch manually controls area counting. The header sensor or implement switch or spray booms automatically turns area counting on and off if the area count switch is in the up position.

When the switch is in the down position, the monitor displays and flashes "Area Off" and stops counting area.

When the switch is in the up position, the monitor will display "Area On" and count area unless the header sensor or implement switch or spray booms are connected and are automatically shutting off area counting.

Stop Height

The stop height number in the monitor determines at what head position the monitor will turn on and off area counting. Refer to the calibrating stop height instructions in the calibration section.

If your monitor is set on the site verification mode and you have an implement switch set the stop height to 50.

The stop height number can be set differently for each grain type. The stop height setting normally will be between 55 and 80 for header sensors on most combines.

Area Count Stop Beeps

This setting determines how many times the monitor will beep to indicate that the monitor is not counting area when turning on the ends. To view and change the area count stop beeps you must press the SETUP key and then the VEHICLE key. Instructions for changing the area count stop beeps are in the setup section under vehicle setup.

NOTE:

- *It is recommended that the area count stop beeps be set high enough so that lowering the head or implement or turning on the spray booms after turning on the ends turns off the beeping rather than the beeps just timing out. This gives the operator an audible signal that the monitor is counting area again.*
- *Usually an area count stop beeps value of 20 to 30 is high enough.*

Ground Speed Sensor

The monitor can record its ground speed from five different sources:

Ground Speed Sensor	Primary Speed Sensor
Speed sensor on transmission	WHEEL
Speed sensor on tracks	TRACK
Radar gun	RADAR
GPS receiver	GPS
Spray controller sending ground speed to monitor. (Application Rate ONLY)	SERIAL

To view and change the ground speed sensor you must press the SETUP key and then the VEHICLE key. Instructions for changing the speed sensor setting are in the setup section under vehicle setup.
You have to calibrate distance for wheels, tracks, or radar, depending on which ground speed sensor you use. Refer to the distance calibration instructions in the calibration section.
The primary speed sensor type is recorded for each load. If you have recorded data for several loads but, you had the wrong primary speed sensor setting, you can switch the speed sensor setting on the loads. Refer to load settings instructions in the operation instructions.
If you are getting your ground speed from a GPS receiver and you lose your GPS signal, the monitor will take readings from the secondary speed sensor.

Adjusting Field Area

If you know the exact field area, you can adjust the monitor field area to the correct value after you finish the field. Follow these steps to adjust the field area:

Area Calibration Screen

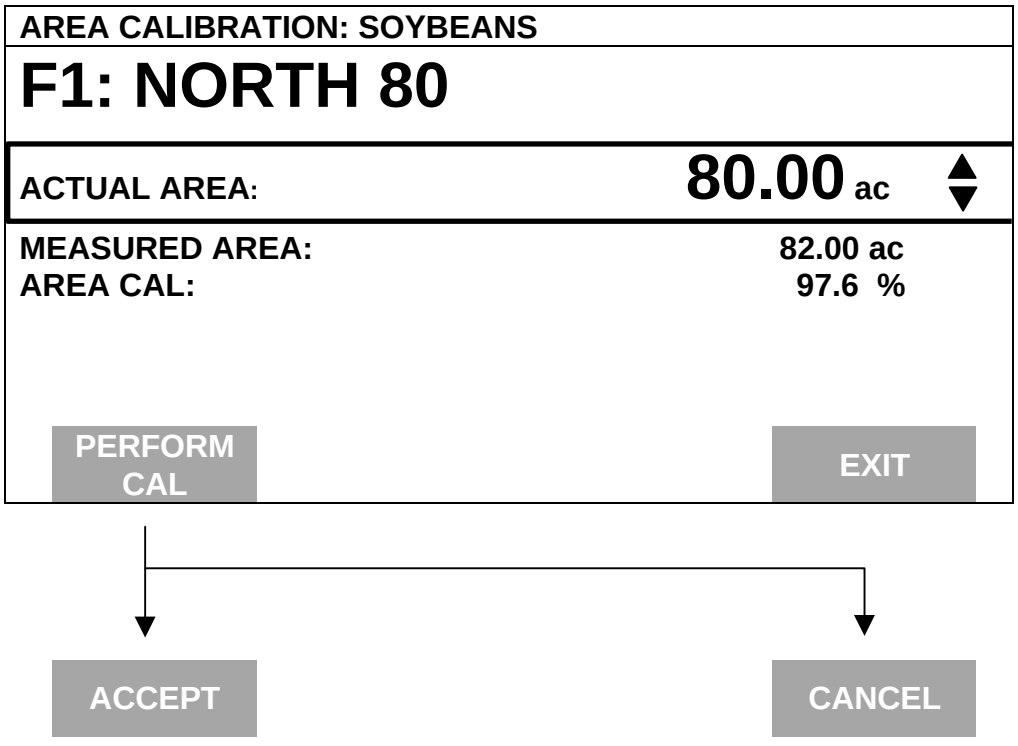
To view the area calibration screen press the:

MENU key 

CAL key

AREA key

Example of area calibration screen:



Calibration Procedure

Step	Action
1	Change the field to a field for which you know the exact area. Select (rectangular box surrounds line) the field by pressing the key to the right of the line displaying field. Use the UP or DOWN ARROW keys to change the field.
2	Select the "Actual Area" line by pressing the key to the right of the line displaying actual area. Use the UP or DOWN ARROW keys to set the actual area.
3	Press the PERFORM CAL key. Press the ACCEPT key.
4	Repeat steps 1-4 for all the fields for which you know the actual area.
5	Press the EXIT key once you have finished.

Note:

- *The monitor proportionally adjusts all the load areas so that the areas from all the loads equal the total field area.*

- *The "Area Cal" number is the actual area divided by the area the monitor originally counted. When you press the PERFORM CAL key, the monitor determines the area calibration number and adjusts the measured area accordingly.*

- *Usually the monitor slightly over counts area when turning on the ends due to error in <u>not</u> turning on and off area counting exactly at the start and end of a pass. It is suggested that you determine an average percent error in counting area and adjust the field area accordingly, even if you do not know the exact field area. Typical area calibration numbers for harvesting row crops are 97-99% and for non rowed crops, 96-98%.*

* * *

Introduction

The PF3000 has its own internal memory which stores all the field and load summary data and setup and calibration settings. The internal memory does not store any GPS data. All GPS data must be logged to a memory card.

Memory Screen

To view the memory screen press the:

MENU key
SETUP key
bottom RIGHT ARROW key
MEMORY key

Example of memory screen:

MEMORY SETUP

Active Field/Load

Field:	**F1: KGXRD**
Load: CORN 1	**L1:**

Fields	**58**
Loads	**227**
Loads (All Modes)	**2**
Available memory	**388064 bytes**
% Memory used	**26 %**

CLEAR LOADS | **ERASE MEMORY** | **PRINT SUMMARY** | **EXIT**

Available Memory

The monitor does not have a pre-determined number of fields and loads that it can store. Instead, you should look at the % memory used to get a relative idea of how many more fields and loads you can create.

Clear Load

If you want to clear one load or all loads in a field, press CLEAR LOADS key. Press EDIT key use the UP or DOWN ARROW to select the field where loads are to be cleared and press ACCEPT key. Scroll down to LOAD and press EDIT key use the UP or DOWN ARROW key to highlight a specific load from a field and press ACCEPT key. Press the CLEAR LOAD key to remove a specific load. The next screen will advise you to press ACCEPT key to clear the load or CANCEL to abort. To remove all loads from a field press CLEAR ALL key. The next screen will advise you to press ACCEPT to clear all loads or CANCEL to abort.

Erase Memory

If you want to clear all the setup, calibration and field and load data in the monitor press the ERASE MEMORY key. The monitor will warn you that you will lose all the data. Press the ACCEPT key to remove all the data. You should normally only clear all the data at the beginning of the season.

Restoring Data from a Memory Card

You can restore field and load data from a memory card. The field and load data can be from a Yield Monitor 2000 or another PF3000. Refer to the card setup instructions in the setup section.

* * *

Introduction

You must have a memory card to do field marking. To perform field marking you can use the internal marker selection keys built into the PF3000 or connect the external field marker device. You can not use both at the same time. You can make marks in all operating modes of the PF3000.

IMPORTANT: Make sure that under the CONSOLE setup key, you have the Field Marker set correctly to either INTERNAL or EXTERNAL.

If you are using the internal marks, you can rename the marks and also set them up as a continuous or spot mark. If you are using the external Field Marker, you can not rename the marks but can do continuous or spot marking.

Continuous marking
Making several marks in a row (for example: marking large weed patches or tile lines).

Spot marking
Marking just one mark (for example: marking a rock or tile hole).

Setting Up Marks

Press the SETUP key and MARKS key to display the marker setup screen and name and set the internal marks. If you are using the external Field Marker, you do not need to make any settings on the Marker Setup screen.

Making Marks

You can mark more than one item at a time. When a mark is turned on the monitor will beep and the mark will flash.

Follow the steps below to make marks when using the internal marks.

Step	Action
1	Display FIELD, LOAD, SHOW MAP, OPTIONS on the bottom by pressing the MENU key  .
2	Press the OPTIONS key to display the marker keys on the bottom.

Step	Action
3	Press MARKS key.
4	**Marks that are set as a Continuous Mark** Press the marker key to start marking at the beginning of the area you want to mark. Press the marker key again to stop marking after you have driven through and reached the end of the area that you want to mark. **Marks that are set as a Spot Mark** Press the marker key once when you are directly over the item you want to mark. The monitor will log one mark and automatically shut off the marking for that mark.
5	After you have finished marking, press the MENU key again to display FIELD, LOAD, MAP, MARKS on the bottom.

Follow the steps below to make marks when using the external Field Marker.

Continuous Marking:
Press the ON key on the appropriate switch at the start of the distance to mark. Travel all the way through the distance, and at the end, press the OFF key on that switch.

Spot Marking:
Press the MARK key once on the appropriate switch just as the vehicle passes over the location of the item in the field.

Connecting External Field Marker

The external Field Marker connects to the 25-pin Port. Make sure that under CONSOLE setup Field Marker is set to EXTERNAL.

Mapping Marks

The marks you make in the field are all logged to a file on the memory card.

*** * ***

Introduction

The PF3000 reads position information from the internal GPS receiver and can record data for mapping. To save GPS data, you must use a memory card. You must use a mapping software to download and archive data from a memory card.

IMPORTANT: You must copy memory to every log file you create before you read the card into your computer.

Memory Card Requirements

The following characteristics are required of memory cards you intend to use with the monitor:

Card Type	Sizes	Specifications
AG LEADER ATA Flash card	2 to 32 megabytes (max)	Type 1 or 2 PCMCIA 68-pin connection 200 ns speed rating

IMPORTANT: AG LEADER ATA Flash cards are the only brand of ATA Flash cards that are guaranteed to work in the PF3000.

*Note: 32 MB AG LEADER ATA Flash cards are available from your **Ag Leader Technology** dealer.*

Setting Monitor to Log to Card

Press the SETUP key and CARD key to view the card setup screen. Set the logging device to a card and select or create a log file.

If you turn the monitor on or start the combine separator without a card in the monitor and the monitor is set to log to a card, the monitor will display "INSERT CARD OR PRESS CANCEL". If you press the CANCEL key, the message will reappear if the separator is engaged. To continue using the monitor without a card, disengage the separator, shut off the monitor and turn it back on again and set the logging device equal to none.

Setting the Logging Interval

Press the SETUP key and CARD key to view the card setup screen. Set the logging interval to 1, 2 or 3 seconds.

When the monitor records a reading for any one of the logging intervals, it takes an average of all the yield readings in that interval.

The number of hours of instantaneous data that can be logged on a memory card depends on the card size and logging interval listed below.

	Approximate Logging Hours Until Card is Full		
	1 sec	**2 sec**	**3 sec**
Ag Leader 32M ATA Flash Card	400	800	1200

NOTE: The logging hours available can vary from the numbers shown above due to the number of separate files that can be stored on the card.

The number of readings taken per foot traveled are also dependent on your logging interval:

	Distance Traveled (ft)		
	1 sec	**2 sec**	**3 sec**
3 mph	4.4	8.8	13.2
5 mph	7.3	14.6	21.9

Log File

The PF3000 requires a log file to store GPS data on a memory card. The log file will always have a ".yld" extension and be named with the date the file was created.

Example: **98081502.yld** This file was the second log file created on 08/15/98.
The criteria for creating log files differs based on the type of card.

Type of Card	Log file criteria
AG LEADER™ ATA FLASH card	A new log file must be created for each day. Can not add to an old log file after a new file has been created. Can store multiple log files on one card.

In order to log instantaneous GPS data or copy field and load data to a memory card, a log file must be selected. The monitor will prompt you when you turn it on to select or create a log file. Refer to the steps below to select/create a log file after you have turned the monitor on.

Step	Action
1	With the memory card inserted into the PF3000, card setup screen displayed, and "Log File" selected, press the EDIT key.
2	Use the UP or DOWN ARROW keys to select a log file. If a log file does not exist on the card or you do not want to log to any of the existing log files on the card, press the CREATE FILE key to create a new log file.
3	With the desired file selected, press the ACCEPT key.

NOTE: After you read all the log files on your card into your computer (and make backup copies of files), it is recommended to erase the log file(s) on the card. This will prevent confusion on which files have been read into your computer the next time you read the card.

Inserting Memory Cards

IMPORTANT: Before you insert the memory card into the monitor, touch the monitor with your hand to ground yourself and prevent any static electricity transfer to the monitor through the card.

Insert the end of the card that has 68 small holes into the monitor with the "front" side of the card (the side with the manufacturer's name or logo) facing up. Be sure to insert the card completely, so that it makes good contact and remains in place. When you insert a memory card the card symbol will appear in the top right corner of the display.

Formatting Card

The memory card must be formatted with a DOS format. You can format the card using the PF3000 or your computer and card reader (using Windows 3.1 or 95). Refer to the instructions for formatting a card in the Card Setup section.

IMPORTANT: Formatting a card erases all data on the card.

Copying Data to Log File

IMPORTANT: Before you remove the memory card from the monitor, you must copy memory to <u>every</u> log file that you have logged to, otherwise your data could be lost. Every time you turn off the monitor you will be prompted to copy memory to a card (this copies memory only to the file set as the log file).

To copy memory to log files that are not set as the current log file, press the SETUP key and CARD key. Press the SHOW FILES key and select one of the log files. Press the FILE OPTIONS key and press the COPY TO FILE key.

At the card setup screen, press the COPY TO CARD key to copy memory to the file set as the log file (this is the same copy to card function that you are prompted to do during shut down).

Logging Data to a Memory Card

When the monitor logs data to a memory card, a small arrow that points to the memory card symbol at the top right corner of the display appears.

Operating Mode	Condition to start logging to card
Grain Harvest Mode Grass Harvest Mode	Combine engaged (elevator speed must be above 250 rpm) and the monitor is either counting area or has grain flow.
Application Rate Mode	Application equipment engaged.
Site Verification Mode	Area count switch on (do not need ground speed).

Checking Free Space on Card

To check the percent of space free on the card display CARD INFO. When the amount of time left on the card is exactly four, three, two, and one hours, the monitor double-beeps warning you that card is almost full.

* * *

Introduction

You can use the internal GPS receiver of the PF3000 to collect field position information for making a map. The GPS receiver sends the exact coordinates in degrees latitude and degrees longitude to the monitor every second. You must use a memory card with the monitor to record GPS position information.

GPS Status Indicator

The PF3000 will display a "D" and "G" on the top right corner of the display to indicate you have a GPS signal. If you do not have a GPS signal you will see two dashes "- -".

NOTE:

- *A "D" indicates that you have a differential signal.*
- *A large "G" indicates that you have a GPS signal and your GPS receiver is tracking four or more satellites.*
- *A small "g" indicates that you have a GPS signal but your GPS receiver is tracking only three satellites.*

The GPS receiver must track four or more satellites (large "G") to get an elevation reading.

* * *

Introduction

To more accurately measure ground speed on sloping fields or in muddy conditions where the wheels slip, you can use a radar gun. Sensors compatible with the monitor are:

- Dickey-john
- Magnavox
- MicroTrak sonar gun
- Case IH Magnum
- John Deere

Necessary Cables

If you intend to use a radar gun, you must buy an adapter cable for your specific sensor from an ***Ag Leader Technology*** dealer. The adapter cable provides power to the radar sensor.

Radar cables for combines
Two cables (only 1 if Dickey-john radar) are used to connect a radar gun to the monitor when used in a combine:

- The radar jumper cable fits between the distribution cable and the moisture sensor's connector. This cable is required for all radar guns.
- The second cable is an extension cable (not needed for Dickey-john radar) and connects to the radar jumper cable and to the radar sensor.

Radar cables for tractors and other vehicles
Refer to the options section for instructions.

Installing a Radar In a Combine

Step	Action
1	Disconnect the existing ground speed cable from your combine speed sensor at the distribution cable. Leave the cable routed in case you want to use the combine's speed sensor again.
2	Mount the radar unit on the combine in a position where it will not be damaged and will be aimed between plant rows. Consult your installation instruction.
3	Route the extension cable (or if Dickey-john, the radar unit's integral cable) to the Distribution cable of the PF3000.
4	Install the radar jumper between the distribution cable and moisture sensor cable.
5	Connect the extension cable (if Dickey-john, integral cable) to the four-pin round connector of the radar jumper cable.

Changing Speed Setting

Press the SETUP key and VEHICLE key to view the vehicle setup screen. Refer to the vehicle setup instructions in the setup section and change the primary speed sensor to “Radar”. You must perform a distance calibration for radar. Refer to the distance calibration instructions in the calibration instructions.

* * *

Introduction

The diagnostic screens provide troubleshooting and reference information for the PF3000.

Diagnostic Screens

To view the diagnostic screens press the:

MENU key 
DIAG key

Press the SYSTEM or YIELD or GPS or RAW NMEA key.
Press the EXIT key when you are finished viewing the screen.
The following are examples of diagnostic screens:

SYSTEM DIAGNOSTICS

Hardware revision	**1.60**
Serial number	**980034**
ROM version	**2.10**
Program version	**2.60**
Operating memory	**18352 bytes**
Storage memory	**519632 bytes**
Vehicle battery	**14.9 volts**

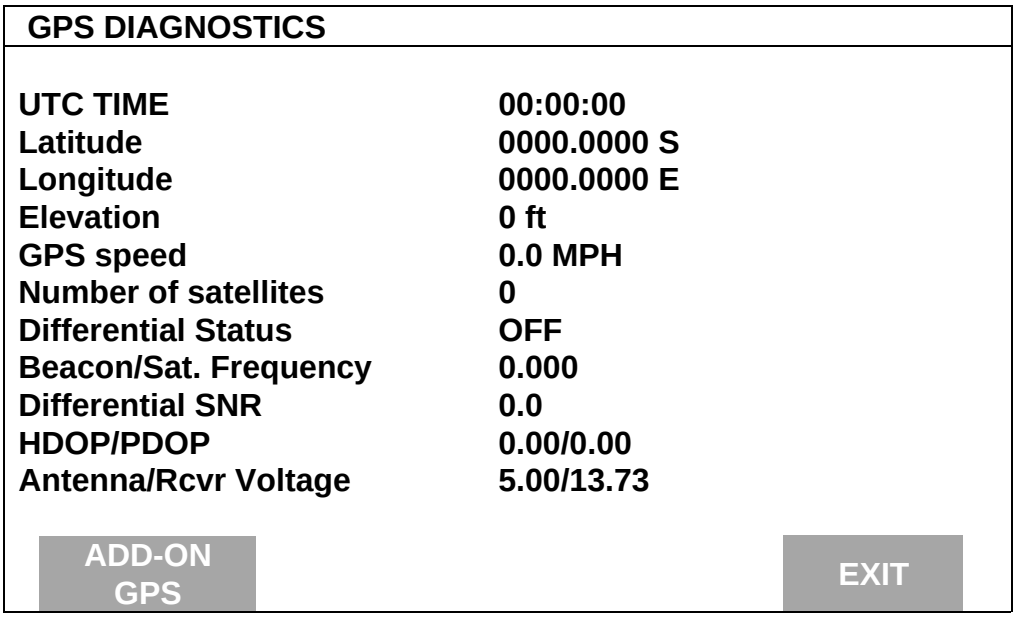
EXIT

The yield diagnostic screen is not present in the application rate or site verification mode.

YIELD DIAGNOSTICS

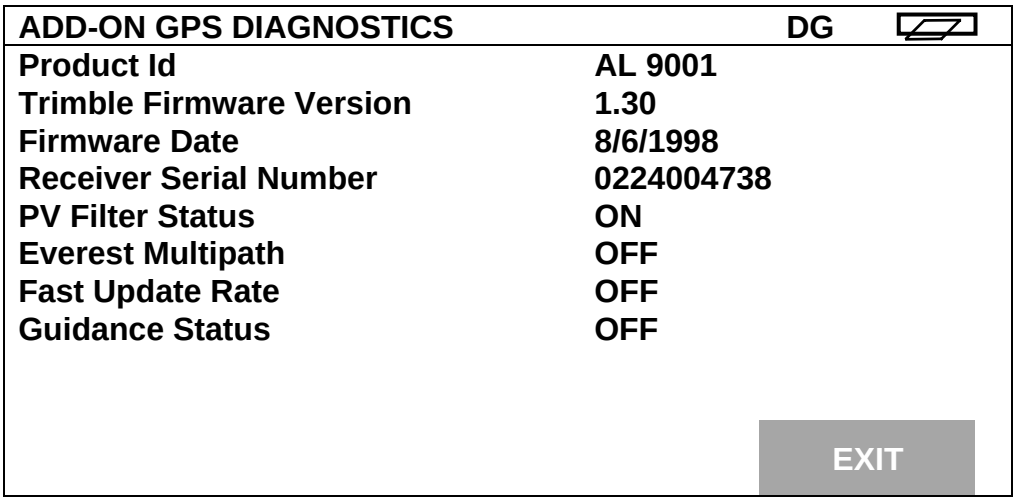
Min / Max	**56797 / 52237**
Moisture Sensor	**0 - - 6.8%**
Flow offset	**300**
Sensor force	**0 lb**
Ground speed	**0 mph**
Elevator speed	**0 rpm**
Header position	**0**
Temperature offset	**-3**

EXIT



Diagnostic Screen

The diagnostic screen provides troubleshooting and reference information for the integrated GPS. Provided are definitions of screen terms.



UTC TIME: Greenwich Mean Time (GMT), the current time Greenwich, England *NOTE: The US Coast Guard may also refer to GMT as "ZULU".*
Latitude: Current latitude of the receiver in degrees-minutes. fractional minutes.
Longitude: Current longitude of the receiver in degree-minutes.fraction minutes.
Elevation: Current elevation of the receiver in feet.
GPS Speed: Current speed of the receiver in miles-per-hour.
Number of Satellites: Indicates the number of satellites the unit is using. The unit can track a maximum of twelve satellites.
Differential Status: Indicates ON or OFF, telling you whether a differential signal is being used.
Beacon/Satellite Frequency: Indicates the frequency of the differential source that the GPS is using of the location of the differential source.
Differential SNR: Signal-to-noise-ration (SNR) indicates the strength of the correction signal in relation to the amount of background noise that can interfere with signal reception. A good SNR is 10 to 18.
HDOP/PDOP: Horizontal Dilution of Precision (HDOP) indicates the quality of the horizontal GPS position. Position Dilution of Precision (PDOP) is a unitless measure indicating when the satellite geometry can provide the most accurate results. When satellites are spread around the sky, the PDOP value is low and the computed position is more accurate. When satellites are grouped close together the PDOP is high and the positions are less accurate.
Antenna/Receiver Voltage: An antenna/receiver voltage of 5 or higher indicates that the antenna is not plugged into the GPS receiver. When the antenna is properly installed, the voltage should read .5 or less.

***

Introduction

The PF3000 has four display lines for viewing items. You can choose what items you see on the display and the position that the items appear on the display.

To change the display item on a display line you must select the line. The four keys to the right of the display each select a display line. A rectangular box surrounds the display line to show that that line is selected.

When the display line is selected the four menu items on the bottom change and show items you can select for display. Press a key below a display item to put a different display item in place of the selected display item. There are more than four display items to choose for viewing. Press the bottom LEFT or RIGHT ARROW keys to scroll to the right or left and view other display items on the bottom.

When some display items (like swath) are selected, an up and down arrow symbol will appear on the right of the display line. This indicates you can change the setting of the item with the UP or DOWN ARROW keys. After you have made the change you must press the key to the right of the display line to deselect the line.

Field and Load Totals

When the following are displayed you can see a field or load total.
Inst Yield
Avg Yield
Inst Moist
Avg Moisture
Wet Weight
Wet Bushels (Not displayed for Grass Seed harvest)
Dry Bushels (Not displayed for Grass Seed harvest)
Area
Distance

To view a field total you must have the field displayed without the load. Press the FIELD key to display the field alone on the top line. To view a load total, you must have the load displayed with the field on the top line. Press the LOAD key to display the load on the top line.

Harvest Display Items

Below are listed in order the available display items for the harvest mode.

INST YIELD
This displays the dry yield in bushels per acre. If you are harvesting, the instantaneous yield is displayed and will change every second. If you are not harvesting the average yield is displayed.

AVG YIELD
This displays the average dry yield in bushels per acre.

INST MOIST
This displays the instantaneous grain moisture if you are harvesting. If you are not harvesting the average grain moisture is displayed.

After you have displayed instantaneous moisture, you can select it again and use the LEFT or RIGHT ARROW keys to switch from automatic to manual moisture for the current load. If you switch to manual moisture, you can use the UP or DOWN ARROW keys to enter a manual moisture value. You must press the key to the right of the line displaying moisture to deselect the line after you have changed the setting.

SWATH
This displays the cutting swath of the combine head. After you have displayed swath, you can select it again and use the UP or DOWN ARROW keys to decrease the swath to a partial swath. You must press the key to the right of the line displaying swath to deselect the line after you have increased the swath back to a full swath.

WET WEIGHT
This displays the estimated wet weight in pounds of grain.

WET BUSHELS (Not displayed for Grass Seed harvest)

DRY BUSHELS (Not displayed for Grass Seed harvest)

AREA

ELEVATOR SPEED
This displays the elevator speed in rpm.

GROUND SPEED

AREA PER HR

GRAIN FLOW
This displays the dry bushels per hour you are harvesting.

TEMP
This displays the temperature of the air or grain if harvesting. (The temperature sensor is located on the moisture sensor).

DISTANCE
This displays the total distance traveled.

LAT LON
This displays the latitude and longitude coordinates from the GPS receiver.

GPS INFO
This displays the number of satellites, frequency, differential on or off and Signal to Noise Ratio (SNR).

ELEV
This displays the elevation from the GPS receiver.

CARD INFO
This displays the percent of memory space available until the card gets full.

DRY LBS/BU
This displays the dry pounds per bushels that the monitor uses for the grain type to calculate dry bushels.

AVG MOISTURE
This displays the average grain moisture.

HEAD HEIGHT
This displays a number to indicate the position of the head. This number is not in feet or inches, but is a number that is relative to the height of the head.

DATE TIME
This displays the current date and time.

FIELD NAME

LOAD NAME

COMPASS HEADING
This displays the direction of travel in degrees.

LIGHTBAR PASS#
This displays the turn direction and the current pass number you have inputed.

MAP ZOOM
Shows scale of on screen map. Choose between automatic scaling or manually zoom in or out.

* * *

Introduction

The summary screen shows totals and averages for your fields and loads. You can also see the field and load totals on the main operating screen (refer to the display item instructions).

You can view items on the summary screen on the go. You should use the summary screen to view data from loads you have previously harvested.

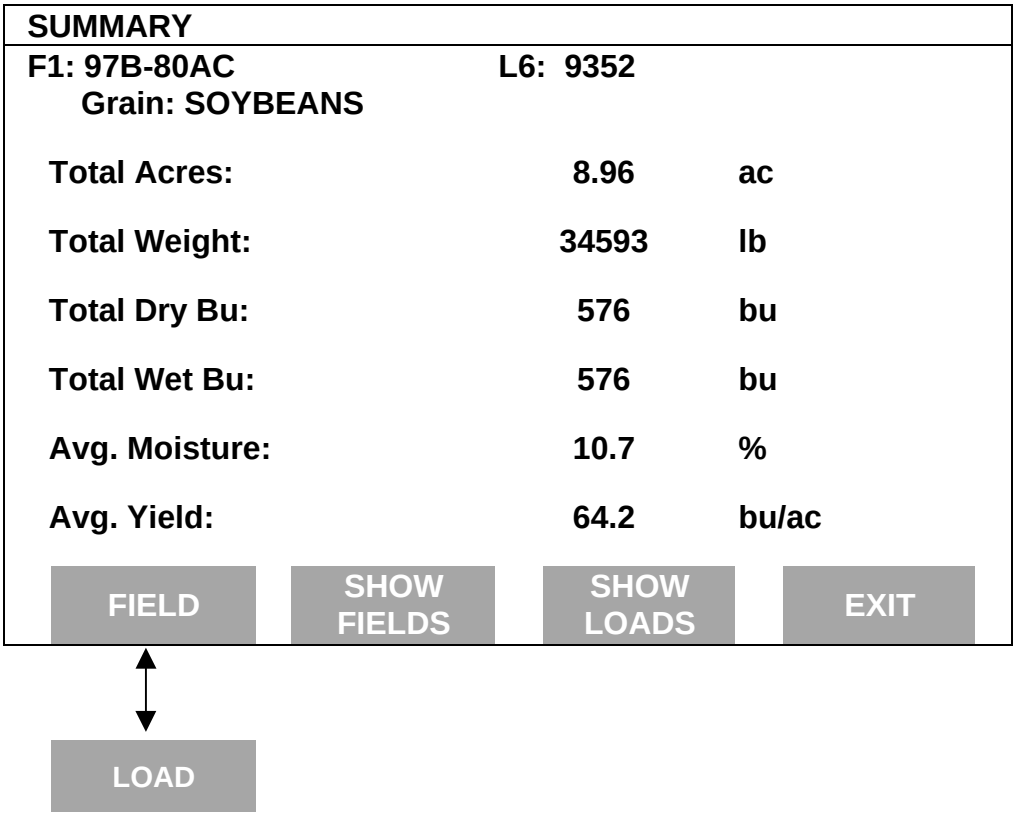
Summary Screen

To view the summary screen press the:

MENU key 

SUMMARY key

Once you have finished viewing the summary screen press the EXIT key.



Changing Field and Load

The FIELD and LOAD key replace each other on the screen depending on whether load is displayed or not. Press the FIELD key to display the field only on the top of the display. Press the LOAD key to display the load beside the field.

A small set of up and down arrows appear to the left of the load if it is displayed or to the left of the field if it is displayed without the load.

Use the UP or DOWN ARROW keys to change the field or load depending on which one has the arrows.

Field and Load Totals

If load is displayed with the field, then the totals and averages are for the load.

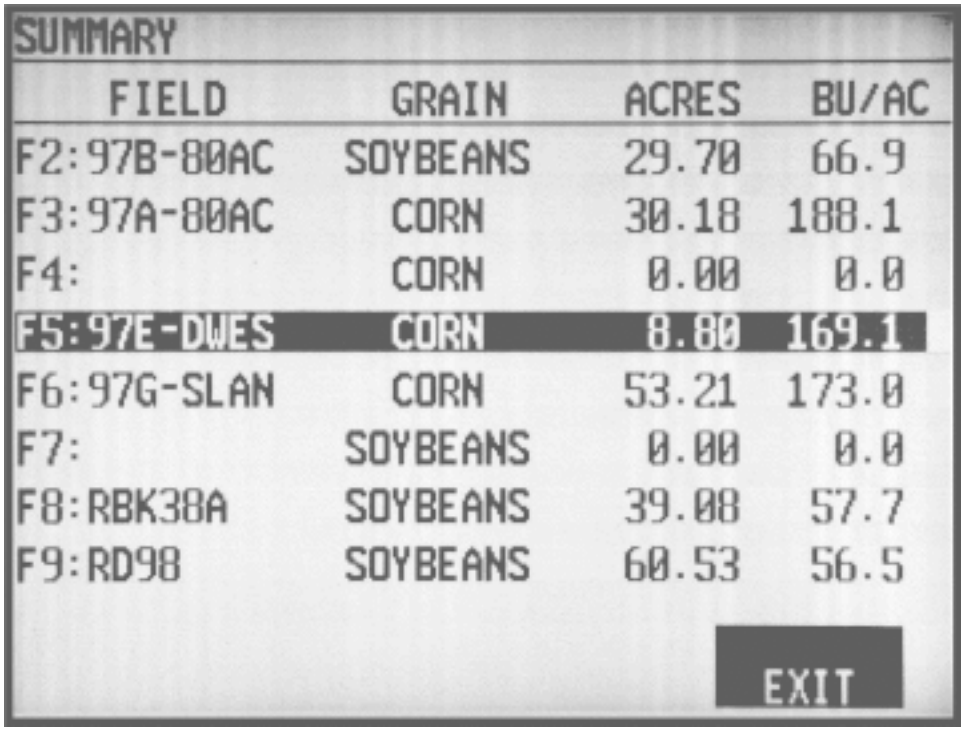
If the field only is displayed, then the totals and averages are for the field.

Show Fields

Press the SHOW FIELDS key to view a list of all the fields as shown below. If you have several fields you will have to use the UP or DOWN ARROW keys to scroll through the all the fields.

One of the fields will be selected or highlighted. You can change the field that is selected by using the UP or DOWN ARROW keys. When you press the EXIT key, the monitor will return to the main summary screen showing the data for the field that was selected.

Example of summary screen:

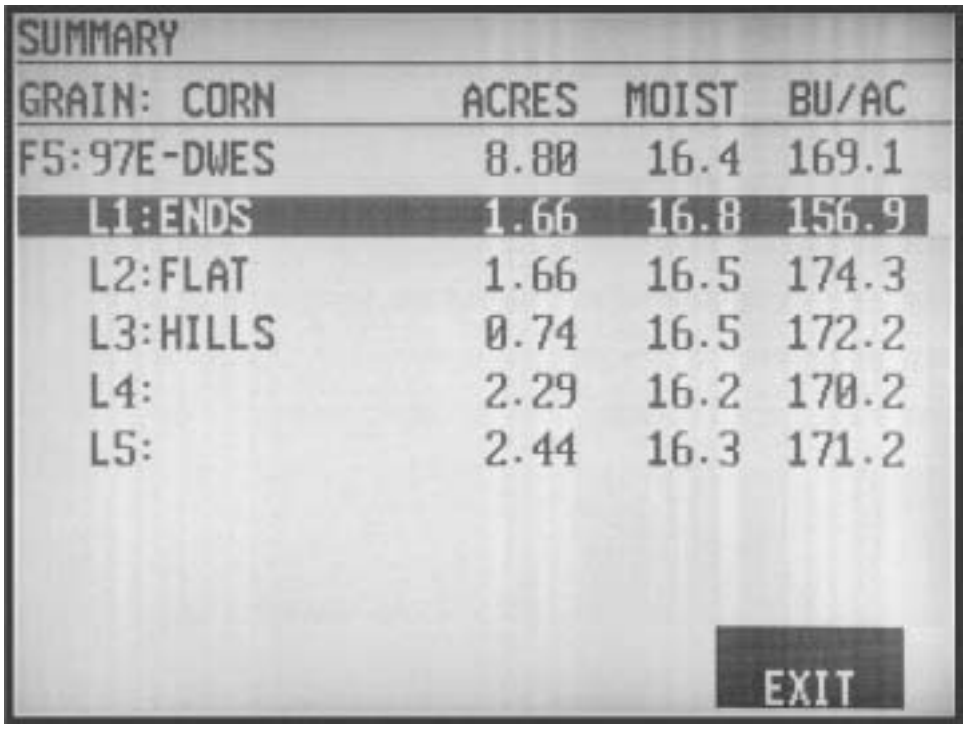


Show Loads

Press the SHOW LOADS key to view a list of all the loads in the field as shown below. If you have several loads you will have to use the UP or DOWN ARROW keys to scroll through the all the loads.

One of the loads will be selected or highlighted. You can change the load that is selected by using the UP or DOWN ARROW keys. When you press the EXIT key, the monitor will return to the main summary screen showing the data for the load that was selected.

Example of load summary screen:



* * *

Setting/Changing Moisture

The operator can set the monitor to take readings from the moisture sensor automatically or he/she can enter an average moisture manually. The moisture is set to automatic or manual for each load. The monitor comes from the factory set on automatic moisture. You should use the automatic moisture setting unless you have a problem with the moisture sensor or you do not have a moisture sensor.
Follow these steps to change the moisture setting.

Step	Action
1	Display moisture on the screen by choosing INST MOISTURE as a display item.
2	Select the line displaying moisture by pressing the key to the right of the display.
3	Use the RIGHT ARROW key to select “Man”.
4	Use the UP ARROW key to set an average moisture for the load.
5	Press the key to the right of the line displaying moisture to deselect the line.

Note:

- *Any new loads you create will have the same moisture setting as that of the last load in the same field.*
- *You can only change the moisture if “man” is selected.*
- *The monitor either uses all the automatic readings or the manual moisture value for the entire load.*

Buildup on the Sensor

The moisture sensor can give readings that are too high if sticky material from weeds or green stems buildup on the moisture sensor. This is normally only a problem in soybeans with a lot of weeds or green stems. If you have high moisture readings, remove the moisture sensor from the combine, check it for buildup, and clean it. After cleaning, continue harvesting. If the buildup condition is severe, you may not be able to keep the moisture sensor clean. In such conditions, set the moisture for the load on manual and enter the average moisture for that load as instructed above. After buildup conditions end, set the moisture back to automatic.

Note:
If buildup is severe, check your flow sensor for buildup on the impact plate attached to the black load cell.

* * *

Introduction

The PF3000 has a separate swath setting for each grain type. The monitor uses the number of rows and row space you set in the monitor to determine the total swath.

Full Swath

The full swath is the normal swath that the vehicle takes during field operation. It is the permanent swath of the combine head. To view and change the full swath settings, you must press the SETUP key and then SWATH key. Refer to the swath setup instructions in the setup section for more instructions.

Partial Swath

You can temporarily enter a partial swath setting when you encounter a less than full swath during field operation (for example point rows). Follow the steps below to enter a partial swath.

Step	Action	
1	**If...**	**Then...**
	Swath is displayed on the main operating screen	Press the key to the right of the line displaying swath to select the line (rectangular box surrounding line).
	Swath is <u>not</u> displayed on the main operating screen	Press one of the four keys to the right of the display and display swath on the main screen. Press the key to the right of the line displaying swath to select the line (rectangular box surrounding line).
2	With swath selected, press the DOWN ARROW key to decrease the swath to the appropriate swath width.	
3	After you have finished the partial swath in the field, press the UP ARROW key to increase the swath back to a full swath.	
4	Deselect swath by pressing the key to the right of swath.	

Note:

- *When you decrease the swath, the monitor will beep to remind the operator that the monitor is set on a partial swath. The monitor will not stop beeping until the swath is increased to the full swath.*

- *If you are operating a cutting platform in non-rowed crops, it is recommended to set the row spacing to 12 inches so that you can decrease the swath by easier-to-see one-foot increments when you encounter a partial swath.*

* * *

Introduction

The monitor must be set on a grain type when harvesting. You can have more than one grain in a field.

Press the SETUP key and GRAIN key to make changes to the settings for a grain. Refer to the grain setup instructions in the setup section of the manual.

Setting/Changing Grain Type

To set or change the grain perform the following steps.

Step	Action
1	Press the FIELD key twice to display the FIELD in large text. Use the UP or DOWN ARROW keys to scroll to the field that you what to change the grain.
2	Press the key to the right of the line displaying the grain to select the grain.
3	Use the UP or DOWN ARROW keys to set the grain. Press the ACCEPT key twice. Once to accept the new grain and once to accept the field.

Note: If you change a grain on a field that already has loads for another grain type, the monitor will create a new set of loads for the new grain type. Refer to the example below. To view the loads of the other grain, you must change the grain on the field back to the old grain type.

Example:

Corn		Soybeans	
F10	L1	F10	L1
	L2		L2
	L3		L3
	L4		L4

* * *

Introduction

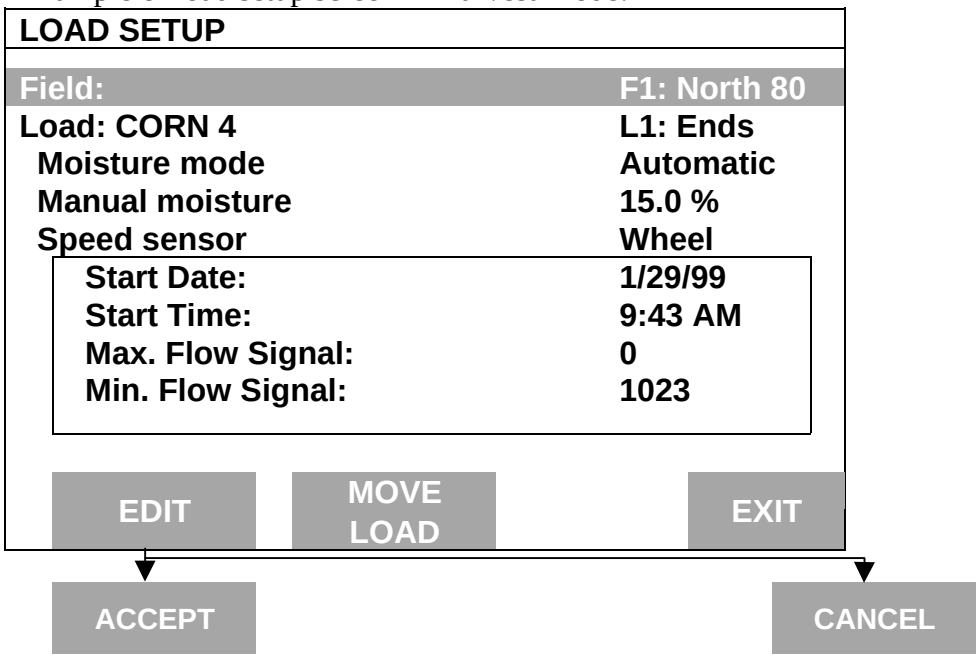
The monitor records various settings for each load used for harvesting.

Load Setup Screen

To view the load setup screen press the:

MENU key
SETUP key
bottom RIGHT ARROW key
LOAD key

Example of load setup screen in Harvest Mode:



Changing a Setting

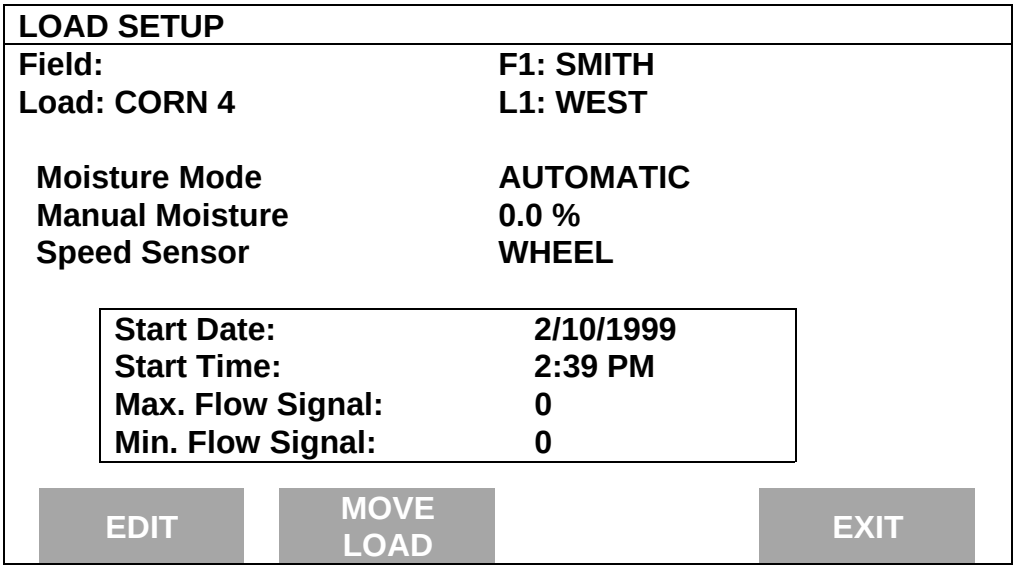
Step	Action
1	Use the UP or DOWN ARROW keys to select a line. A line is selected when a black filled rectangular box surrounds the entire line.
2	Press the EDIT key. Use the UP or DOWN ARROW keys to change the setting. Press the ACCEPT key.
3	Press the EXIT key once you have made all the settings.

NOTE:If you change the speed setting, you will change the distance and area for that load. The manual moisture will not be used unless you have the moisture mode set to manual.

Move Load

To move a load to another field or change grain type of load, press the MOVE LOAD key.

Step	Action
1	Set the field and load you want to move or change grain on name and press the ACCEPT key.
2	Press MOVE LOAD key and set the field the load will be moved to and the new grain type.
3	The screen will tell you that the current load will become the last load in the field and grain you have selected. Press CREATE NEW LOAD key.
4	The next screen will have you verify the field, grain and load that is being moved. If the information is correct, press the ACCEPT key.



* * *

Introduction

You can use the PF3000 with integrated GPS receiver in a tractor or other vehicle to record data for making maps of where:

- You plant different seed varieties or seed populations
- You apply different herbicides, pesticides, or fertilizers, or use different application rates
- tile lines, known problem areas, or other fixed field features
- To perform grid and field boundary function for soil sampling, refer to Operation Section for instruction.

Requirements

- Memory card
- Cables to install the monitor in a tractor or other vehicle
- Monitor-mounting bracket

NOTE:
Cables (to connect to a ground speed sensor or implement switch) and monitor-mounting bracket can be ordered from your ***Ag Leader Technology*** *dealer.*

Site Verification Operating Mode

To perform site verification, you must have the monitor set on the "Site Verification" operating mode. To view and change the operating mode you must press the SETUP key and then the CONSOLE key. Instructions for changing the operating mode are in the setup section under console setup.

Logging to the Card

In the "Site Verification" operating mode the following starts or stops logging to the card:

- If the area count switch is in the up position and the monitor displays "Area On" the monitor will log to the card (if you are using an implement switch, it automatically starts and stops logging to the card when the implement is raised and lowered on the ends).
- If the area count switch is in the down position and the monitor displays "Area Off" then the monitor will not log to the card.

Note: You should create a new file to log one kind of site verification data (tile lines, or location of hybrids, varieties, etc.) on a card. Multiple files can be created on the same card as long as there is enough space on the card

Example:
Create a new file to log tile line data and then create a new file to log hybrid data on the same card. You can read the card after you have finished logging the tile line then save the data to your PC. Then erase the card create a new file and then log the hybrid data.

Naming Loads

You must name the load the name of the product or item you are site verifying. Instructions for creating and naming fields and loads are in the setup section.

Example:

F2:	WEST 80	L1: HYBRID A
		L2: HYBRID B
		L3: HYBRID C

Field Boundary , Gridding and Tile Lines

Refer to the Boundary and Gridding instructions in the Operations Section of this manual. To map a tile line you will need to change the monitor to Site Verification mode. Choose your field and create a name; now create and name a load for that tile line. The example shows Load 1 as 8 inch plastic tile installed in 1999 and Load 2 as 12 inch clay tile installed in 1963 in Field 2 named as West 80.

Example:

F2:	WEST 80	L1: 8plast99
		L2: 12clay63

Making a Map

If you are using a GPS receiver and memory cards, press the MENU key, SETUP, CARD, COPY TO CARD to copy summary information to the files so that maps can be made.

Read this file into a program that will read the yld file formats. Print the maps for each field.

* * *

Introduction

The PF3000 console is designed to easily mount in a tractor cab or other vehicle and connect to an application rate controller or flow meter device. The PF3000 can monitor and/or control the application rate of a controller or flow meter device. See the setup section for instructions for compatible controllers and flow meter devices. You can monitor and/or control application rates for:

- Planting rates
- Spraying rates
- Fertilizing rates

NOTE: The PF3000 can monitor and/or control only one application rate of a single product.

Requirements

- GPS receiver
- Memory card
- Application rate controller or flow meter device (controller console must have a 9-pin serial port for PF3000 to do application rate control)
- Cables to connect to the application rate controller or flow meter device
- Monitor-mounting bracket

*NOTE: Cables and monitor-mounting bracket can be ordered from your **Ag Leader Technology** dealer. Refer to the options section for instructions on ordering cables.*

Application Rate Operating Mode

To monitor or control application rates, the PF3000 must be set on the "Application Rate" operating mode. To view and change the operating mode you must press the SETUP key and then the CONSOLE key. Instructions for changing the operating mode are in the operation section under "Updating Operating Program."

Logging Actual Rate and Area Counting

After a product/controller configuration is created and checked as active under the FIELD key, the monitor is ready to log the actual rate or "As-Applied" rate.

If "Actual Rate" and "Ground Speed" are not displayed on the main screen, display them. As soon as application starts, the PF will show an instantaneous actual rate. It should match the rate displayed by your controller. The logging arrow should also appear between the DG and card symbol in the top right of the screen.

Area should start to count when application starts. If the area count switch is in the Up position, AREA OFF should go to AREA ON in the lower right of the screen.

If "Swath" is not displayed on the main screen, display it. Swath will appear when application starts. If the PF is connected to a controller with a serial port, the swath width should automatically change as booms are turned on or off.

You should refer the display items for the application rate mode in the operation section. You can display the items that are most useful to you.

The PF3000 logs all instantaneous application rate data into the yld file

Setting the Target Rate

After a product/controller configuration is created and checked as active under the FIELD key, the monitor is ready to send a target rate to the controller.

The target rate is the application rate for the product you are applying that the PF3000 sends to the controller device.

If "Target Rate" is not displayed on the main screen, display it. If you do not see Up or Down Arrow symbols to the right of the line displaying "Target Rate" press the key to the right of that line. Press it again to remove the selection box and keep the Up or Down Arrow symbols.

The "auto" or "man" selection is changed by pressing the Right or Left Arrow keys. "Auto" means the target rate comes from the tgt prescription file. "Man" means the target rate is set manually by using the Up or Down Arrow keys. The manual rate changes according to the "Target Rate Increment" setting found under the SETUP key and APP RATE CONFIG key. When viewing the map, "auto" will appear as "a" and "man" as "m."

The On/Off designation indicates whether the PF is attempting to control the rate. When it is Off the PF is not attempting to control the rate. It will only be Off when "auto" is selected and no tgt prescription file is set.

The tgt prescription file must set for each field. It is found under the FIELD key, VIEW CONFIG key and EDIT TGT FILE key.

Creating Tgt Prescription Rate Files

A tgt prescription rate file (xxxxxxx.tgt) contains the geographically referenced application rates for one product in one field. The application rates are geographically referenced using a raster or grid method. The name of the file can be up to eight characters long and always has a file extension of .tgt.

You can have several target rate files for different fields on the memory card at one time. However, do not put more target rate files on a card than you need, because there needs to be sufficient room left on the card to log the actual application rate data.

The tgt file must be created using a mapping software program such as Ag Leader's SMS mapping program. Check with your mapping software company to determine if your program can create tgt files for the PF3000.

You should name the tgt file either the field name or product name so that when you are in the field you can identify the tgt file. Your mapping software should ask you to enter the following information before you can save the target application rates to the card.

Grid size of .tgt file

Recommended grid size of .tgt file is 10 feet. Please note the grid size of the original prescription map does not need to be 10 feet, it can be larger. Ten feet is recommended only when exporting or creating the .tgt file after the prescription map is built.

* * *

Introduction

The PF3000 has four display lines for viewing items. You can choose what items you see on the display and the position that the items appear on the display.

To change the display item on a display line you must select the line. The four keys to the right of the display each select a display line. A rectangular box surrounds the display line to show that that line is selected.

When the display line is selected the four menu items on the bottom change and show items you can select for display. Press a key below a display item to put a different display item in place of the selected display item. There are more than four display items to choose for viewing. Press the bottom LEFT or RIGHT ARROW keys to scroll to the right or left and view other display items on the bottom.

When some display items (like swath) are selected, an up and down arrow symbol will appear on the right of the display line. This indicates you can change the setting of the item with the UP or DOWN ARROW keys. After you have made the change you must press the key to the right of the display line to deselect the line.

Field and Load Totals

When the following are displayed you can see a field or load total.
Actual Rate
Total Units
Area
Distance

To view a field total you must have the field displayed with out the load. Press the FIELD key to display the field alone on the top line. To view a load total, you must have the load displayed with the field on the top line. Press the LOAD key to display the load on the top line.

Application Rate Display Items

Below are listed in order the available display items for the application rate mode.

TARGET RATE
This displays the target rate value that is sent to the controller device. It also indicates whether the target rate is on or off. You can also change between an auto and man (short for manual) target rate.

ACTUAL RATE
This displays the instantaneous actual application rate. If the vehicle is not moving and the application equipment is shut off, this will display the average actual application rate.

AREA

SWATH
Swath will be zero until application starts. This displays the full swath of set up for the active product/controller configuration.

TOTAL UNITS
This displays the total amount of the product that has been applied.

GROUND SPEED

AREA PER HR

DISTANCE

ACTUAL GPM
This is instantaneous gallons per minute that is measured by your flow meter. This is a meaningless number if you are planting or fertilizing.

ACTUAL GPA
This is the instantaneous actual gallons per acre value that you are applying and your sprayer controller is controlling. If you are planting or applying fertilizer, this is a meaningless number.

CONV. TGT RATE
This displays the target rate stored in the .tgt prescription file. This will be the same rate as the Target Rate display item only when Tgt Units: Controller Units setting is 1:1.0000.

DRIVE RPM
This instantaneous actual rpm of the Rawson Drive or shaft speed. This number is a meaningless number if you are spraying.

GPS INFO
This displays the number of satellites, frequency, differential on or off and Signal to Noise Ratio (SNR).

LAT LON
This displays the latitude and longitude coordinates from the GPS receiver.

COMPASS HEADING
This displays the direction of travel in degrees.

ELEV
This displays the elevation from the GPS receiver.

CARD INFO
This displays the percent of memory space available until the card gets full.

DATE TIME
This displays the current date and time.

TARGET FILE
This displays the target rate file that is opened.

FIELD NAME

LOAD NAME

LIGHTBAR PASS #
This displays the turn direction and the current pass number you have inputed.

MAP ZOOM
Shows scale of on screen map. Choose between automatic scaling or manually zoom in or out.

* * *

Introduction

You can transfer a field/load summary from your monitor to any computer on which you have a communications and word processing program. Computers with Microsoft Windows 3.1, Windows 95, and Windows 98 have these two types of programs. If you do not have a computer or access to a computer, call ***Ag Leader Technology***. We will send a memory card to you and will print your field/load summary for you. Step-by-step instructions are provided in the following pages for creating a field/load summary with the accessory programs in Windows 3.1 or Windows 95 or Windows 98.

Windows 3.1 Introduction

The Terminal communications and Write word-processing programs should be in the Accessories group in the Program Manager window. These are very basic communications and word processing programs. You do not have to use them if you have equivalent software that you want to use, such as Procomm (communications) and Microsoft Word or WordPerfect (word processing). If you use other software, you should be able to follow the procedures given below. Simply use the commands corresponding to those given for Terminal and Write.

Connecting the Monitor to Your PC (Windows 3.1)

Follow these steps to connect the PF3000 to your computer:

Step	Action
1	Remove the PF3000 console from the combine, place it near your computer, connect the provided 12 volt DC power supply.
2	With the monitor off, connect one end of the PC interface cable (with two, nine-pin connectors) provided with the monitor to port 1 on the bottom of the monitor. **IMPORTANT: The PF3000 has voltages on the nine-pin serial port that should not be connected to your computer. Therefore, use only the special PC interface cable (only connects pins 2, 3, and 5) supplied by *Ag Leader Technology*. Do NOT use a standard cable.**

Step	Action
3	Find an unused COM port on the back of your computer (if they are all in use, you will have to disconnect another device from one of the ports). This port will have either 9 or 25 pins. If it is a nine-pin port, connect the cable from the monitor directly to the port. If it is a 25-pin port, use the adapter provided with the cable to connect to the computer.

Follow these steps to set up Terminals to accept information from the monitor:

Step	Action
1	Double-click on the **Accessories** icon in the Program Manager window.
2	Double-click on the **Terminal** program in the Accessories group.
3	If the Terminal window does not fill the whole display, maximize it by clicking on the **up-arrow** at the top-right corner of the Terminal window.
4	Click on **Settings** on the top menu bar to access the Settings pull-down menu.
5	Click on **Terminal Preferences** to access the Terminal Preferences dialog box. Click on the appropriate items to select the following: • **Line Wrap** = Off (no X in box) • **Terminal Font** = Courier • **Translations** = None
6	Click on **OK** to close the dialog box.
7	While in the Terminal program, click on **Settings** on the top menu bar to access the Settings menu.
8	Click on **Communications** to access the Settings dialog box.
9	Click on the appropriate items to set the following communications parameters: • **Baud Rate** = 9600 • **Data Bits** = 8 • **Stop Bits** = 1 • **Parity** = None • **Flow Control** = None • **Connector** = COM1 or COM2* * Select the port to which you connected the cable from the monitor. If you do not know to which one you are connected, try COM1 first.
10	Click on **OK** to close the dialog box.

Follow these steps to set the monitor to communicate with the computer:

Step	Action
1	Turn on the PF3000.
2	After the monitor displays the currently selected field (it does not make any difference which field the monitor is set on), press the Menu Key, SETUP, MEMORY, PRINT SUMMARY "Print Field Summary" will appear on the display.
3	Press **Enter** (or Return) on the PC keyboard. If "Type PRINT, NAME or START & press Enter" appears on the PC display every time you press Enter, you have established proper communications.

If "Type PRINT, NAME or START & press Enter" does not appear on the PC display, perform the following procedures:

- Recheck the parameters you set in the Communications dialog box under the Settings menu. If the settings are correct, try setting a different COM port in case the COM port you are using is not the port to which the monitor cable is connected.

- If you still do not have communications, check the cable connection to determine whether you are connected to something other than a COM port.

- If communications still are not established, follow these steps:

Step	Action
1	Turn off the PF3000, then turn it back on.
2	Press the Menu Key, SETUP, MEMORY, PRINT SUMMARY "Print Field Summary" will appear on the display.
3	Press **Enter** (Return key) on the PC keyboard and look for the message "Type PRINT, NAME or START & press Enter"

- If you are unable to establish communications, call ***Ag Leader Technology*** at 515-232-5363 for assistance

Capturing Field/Load Summary (Windows 3.1)

After you receive the message "Type PRINT, NAME, or START & press Enter"**,** you must capture the field and load summary in a file using the Terminal program. Follow these instructions:

Step	Action
1	Click on **Transfers** on the top menu bar of the Terminal program.
2	Click on **Receive Text File**. A dialog box appears.
3	Enter a name under which you want to keep the field/load summary file. *NOTE:* • *You must use an extension on the file name (such as .EXT in FILENAME.EXT where FILENAME is the file name and .EXT is the extension). You can use any combination of three letters and/or numbers for the extension. You may want to code the extension to indicate the date of the summary, such as N15 for November 15. You can also use a WRI extension so that the Write word processor immediately recognizes it as a word processor file.* • *Select a directory in which you will easily be able to find the file later. The default directory is C:\Windows, which is probably not where you want to put this file.*
4	Click on **OK** to close the dialog box.
5	Using the PC keyboard, type the word **print** and then press **Enter (**Return). "First Field Number to be Printed" appears on the PC display.
6	Type a valid field number (**example:** only 1, not F1) and then press **Enter** (Return). "Last Field Number to be Printed" appears on the PC display.
7	Type a field number (**example:** only 10, not F10) which is at least as high as the first number entered. If you want to print all fields, do not enter a number.
8	Press **Enter** (Return). The field/load summary should scroll up the PC screen. As it scrolls, it is captured in the file name you entered.
9	The message "Type PRINT, NAME or START & press Enter" appears on the last line after the monitor has sent information on all existing fields and loads. Click on **Transfers** on the top menu bar of the Terminal program.

Step	Action
10	Click on **Stop** in the Transfers menu to close the summary file.
11	Click on **File** on the top menu bar and then click on **Exit** in the File to exit the Terminal program.
12	Terminal asks you whether you want to save the settings. Click on **Yes** to save them so that you do not have to reset them the next time you use Terminal.
13	Enter a file name for saving the parameters. If you have no preferences for a file name, use the name SETTINGS.TRM. The next time you use Terminal, you can reload the settings. Follow these steps: Simply, then

Step	Action
1	Click on **File** on the Terminal menu bar.
2	Click on **Open.**
3	Highlight SETTINGS.TRM.
4	Click on **OK.**

Accessing Field/Load Summary (Windows 3.1)

Follow these steps to print the field/load summary:

Step	Action
1	Double-click on the **Accessories** icon in the Program Manager.
2	Double-click on the **Write** icon.
3	Click on the **Up Arrow** at the top-right corner of the Write window to maximize the window if it does not fill the whole display.
4	Click on **File** on the menu bar.
5	Click on **Open.**
6	Double-click on the directory containing the file that you captured with the Terminal program. *NOTE: If you did not use a .WRI file extension when you captured the file with Terminal, change the default text in the File Name box from ***.WRI**, the default file extension for Write, to ***.*** and click on **OK** to show all the files in the directory.*

Step	Action
7	Double-click on the correct file name to open the file.
8	When Write asks whether you want to convert the file to Write format, click on **Convert**. An unformatted version of the field/load summary will appear on the PC. *NOTE: The columns of the summary are not aligned because a font with a constant character width, such as Courier, has not been set.*
9	If the file does not contain the correct information, you may have opened the wrong file. Repeat steps 4 through 8 to open a different file. *NOTE: Keep a log of the filenames with their extensions so you may refer to it during this procedure.*

Formatting the Document (Windows 3.1)

Follow these steps to format the document before printing:

Step	Action
1	After the document is open in Write, click on **Document** on the menu bar.
2	Click on **Page Layout.**
3	Change the **Page Margins** to: • **Left** = 0.5 inch • **Right** = 0.5 inch • **Top** = 0.75 inch • **Bottom** = 0.75 inch
4	Click on **OK.**
5	Select the entire document by placing the cursor (click with the mouse) at the beginning of the text, then, using the scroll bar to scroll to the end of the text, hold down the Shift key and position the cursor at the end of the text. When the entire document is selected, the text is white on a black background.
6	Click on **Character** on the menu bar.
7	Click on **Fonts.**
8	Select **Courier** font in **10 Point** size. *NOTE: You may have to scroll in the font box to find Courier.*
9	Click on **OK** to close the dialog box.

Follow these steps to clean up the file format:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Delete words or messages that are before or after the field and load summary. Enter a title of your choice at the beginning of the summary.

NOTE: Include a date in your title line.</td></tr>
<tr><td>2</td><td>If you like, make field headings bold. Follow these steps:
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Highlight a heading.</td></tr>
<tr><td>2</td><td>Click on Character on the menu bar.</td></tr>
<tr><td>3</td><td>Click on Bold.</td></tr>
</table></td></tr>
<tr><td>3</td><td>Add or delete blank lines to insert page breaks at the most convenient points (try to keep as much of each field as possible on a page).

NOTE: In the Write program, page breaks are indicated by the symbols >> in the left margin. Lines with >> to the left of them are the first lines of each page.</td></tr>
<tr><td>4</td><td>Follow these procedures if you want to number the pages:
<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Click on Document on the menu bar.</td></tr>
<tr><td>2</td><td>Click on Footer.</td></tr>
<tr><td>3</td><td>Click on Insert Page #.</td></tr>
<tr><td>4</td><td>Click on Print on First Page.</td></tr>
<tr><td>5</td><td>Change Distance from Bottom to 0.5 inch.</td></tr>
<tr><td>6</td><td>Click on Paragraph in the menu bar, then click on Centered.</td></tr>
<tr><td>7</td><td>Click on Return to Document in the Footer dialog box.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Click on File on the menu bar.</td></tr>
<tr><td>6</td><td>Click on Character on the menu bar and then click on Save.</td></tr>
<tr><td>7</td><td>A message will ask you whether you want to replace an existing file. Click on Yes.</td></tr>
</table>

Printing Field/Load Summary (Windows 3.1)

Follow these steps to print the field/load summary:

Step	Action
1	Click on **File** on the menu bar.
2	Click on **Print.**
3	Click on **OK** if you want to print the entire summary. *NOTE: If you are not ready to print all the pages, click on **Pages** and then select the page range that you want to print*.

After you have printed the summary, review it for obvious errors in calibration, naming fields and loads, etc. Refer to the instructions in the Checking Data Accuracy document in this section for more information on reviewing the data.

Windows 95 and 98 Introduction

The **HyperTerminal** communications program and the **WordPad** word processing program in Windows 95 are accessed by clicking on **Start, Programs, Accessories.** HyperTerminal and WordPad are basic communications and word processing programs, which you do not have to use if you have equivalent software you want to use, such as Procomm for communications and Microsoft Word and WordPerfect for word processing. If you use other software, you should be able to follow the procedures given below. Simply use the commands corresponding to those given for HyperTerminal and WordPad.

Connecting the Monitor to the PC (Windows 95, 98)

Follow these steps to connect the PF3000 to your computer:

Step	Action
1	Remove the PF3000 console from the combine, place it near your computer, connect the provided 12 volt DC power supply.
2	With the monitor off, connect one end of the PC interface cable (with two, nine-pin connectors) provided with the monitor to port 1 on the bottom of the monitor. **IMPORTANT: The PF3000 has voltages on the nine-pin serial port that should not be connected to your computer. Therefore, use only the special PC interface cable (only connects pins 2, 3, and 5) supplied by *Ag Leader Technology*. Do not use a standard cable.**
3	Find an unused COM port on the back of your computer. If they are all in use, you must disconnect another device from one of the ports. The COM port will have either 9 or 25 pins. If it is a nine-pin port, connect the cable from the monitor directly to the port. If it is a 25-pin port, use the adapter provided with the cable to connect to the computer.

Follow these steps to set up HyperTerminal to accept data from the yield monitor:

Step	Action
1	Click on **Start.**
2	Click on **Programs.**
3	Click on **Accessories.**
4	Double-click on **HyperTerminal.**
5	Double click on the icon with **hypertrm** or **hypertrm.exe** under it. A series of popup screens will appear on the PC display.
6	Enter a name in the "Connection Description" popup (**recommendation:** PF3000). Choose an icon that will be associated with the name you entered and then click the **OK** button.
7	Click on the down arrow at the bottom of the "Phone Number" popup where it says "connect using" and choose the COM port to which the monitor is connected. If you do not know the COM port, begin with "Direct to COM1", then click on **OK**.

Step	Action
8	Make the following settings in the "Comx Properties" popup, then click on **OK** when you are done. • **Bits per second** = 9600 • **Data bits** = 8 • **Parity** = None • **Stop bits** = 1 • **Flow control** = None
9	Follow these steps to set file properties:

Step	Action
1	Click on **File** on the menu bar.
2	Click on **Properties**. A popup labeled "(name you entered) Properties" appears.
3	Click on **Settings** to the right of the phone number tab.
4	Click on **ASCII Setup.**
5	Click on the **check mark** next the last setting, **wrap lines that exceed terminal width** to make the mark disappear.
6	Click on **OK** twice to return to the main HyperTerminal screen.

Follow these steps to set the monitor to communicate with your computer:

Step	Action
1	Turn on the PF3000.
2	After the monitor displays the currently selected field (it does not make any difference which field the monitor is set on), press the Menu Key, SETUP, MEMORY, PRINT SUMMARY "Print Field Summary" will appear on the display.
3	Press **Enter** (or Return) on the PC keyboard. If "Type PRINT, NAME or START & press Enter" appears on the PC display every time you press Enter, you have established proper communications.

If "Type PRINT, NAME or START & press Enter" does not appear on the PC display, perform the following procedures:

- Follow these steps to recheck the parameters you set: in the Properties window under the File menu by clicking on the Configure button.

Step	Action
1	Click on **File.**
2	Click on **Properties.**
3	Click on **Configure,** then ensure the parameters are correct.

- If the parameters are correct, follow these steps to select a different COM port.

Step	Action
1	Click on **File.**
2	Click on **Properties.**
3	Change to a different COM port.
4	Click on **Configure** to set the parameters for the new COM port according to Step 8 in the HyperTerminal Setup (Windows 95) section above.

- If communications are not established, check the cable connection to see whether it is connected to something other than a COM port.

- If communications still are not established, follow these steps:

Step	Action
1	Turn off the PF3000, then turn it back on.
2	Press the Menu Key, SETUP, MEMORY, PRINT SUMMARY "Print Field Summary" will appear on the display.
3	Press **Enter** (Return key) on the PC keyboard and look for the message "Type PRINT, NAME or START & press Enter"

- If you are unable to establish communications, call ***Ag Leader Technology*** at 515-232-5363 for assistance.

Capturing Field/Load Summary (Windows 95)

After the message "Type PRINT, NAME, or START & press Enter" appears, follow these steps to capture the field and load summary in a file using HyperTerminals:

Step	Action
1	Click on **Transfers** on the menu bar, then click on **Capture Text.** A dialog box appears.
2	A small window labeled "Capture Text" appears in the center of the screen. Delete the text in the small rectangular box that is to the right of the word File: and type in the box **c:\summary.txt**.
3	Click on **START** to close the dialog box.
4	Type the word **print** from the PC keyboard and then press **Enter** (**Return**). "First Field Number to be Printed" appears on the PC display.
5	Type a valid field number (**example:** only 1, not F1) and then press **Enter** (**Return**). "Last Field Number to be Printed" appears on the PC display.
6	Type a field number (**example:** only 10, not F10) which is at least as high as the first number entered. To print all fields, do not enter a number.
7	Press **Enter** (**Return**). The field/load summary scrolls up the PC display. As it scrolls, it is being captured in the file name you entered.
8	After "Type PRINT, NAME or START & press Enter" appears on the last line (this message indicates that the monitor has sent information on all the existing fields and loads) Click on **Transfers.**

Step	Action
9	Click on **Capture Text…** then click on **Stop** to close the file into which the yield data was captured.
10	Click on **File** on the menu bar and then click on **Exit** to exit HyperTerminal.
11	If the message "You are currently connected, Are you sure you want to disconnect now?" appears, click on **Yes.**
12	At the PC's request to save the existing session, click on **Yes**.

Accessing Field/Load Summary (Windows 95, 98)

You can use any word processing program to print out your field and load summary. Follow these steps to access the field/load summary data through the WordPad program in Windows 95:

Step	Action
1	Click on **Start.**
2	Click on **Programs.**
3	Click on **Accessories.**
4	Click on **WordPad.**
5	Click on **File** on the menu bar.
6	Click on **Open.**
7	A small window labeled "Open" appears in the middle of the screen. In the "Look in:" box select **c:.** In the box to the right of "Files of type:" select **All Documents (*.*)**. In the large box in the window highlight the file **summary.txt** by clicking on it one time (you may have to use the left-right scroll bar at the bottom of the window and scroll to the right until you see the file). Once the file is highlighted, click the **Open** button to open the file. *NOTE: The columns of the summary are not aligned because a font with a constant character width, such as Courier, has not been set.*
8	If the file does not contain the correct information, you may have opened the wrong file. Repeat steps 5 through 7 to open a different file.

Formatting the Summary (Windows 95, 98)

Follow these steps to format the summary in WordPad:

Step	Action
1	With the summary document open in WordPad, click on **File** on the menu bar.
2	Click on **Page Setup**.
3	Click on **Page Margins,** then set the margins as follows: • **Left** = 0.5 inch • **Right** = 0.5 inch • **Top** = 0.75 inch • **Bottom** = 0.75 inch
4	Click on **OK** to close the dialog box.
5	Click on **Edit** and then click on **Select All** to select the entire document.
6	Follow these steps to change the font:

Step	Action
1	Click on **Format** on the menu bar.
2	Click on **Fonts.**
3	Select the **Courier** font. **Note:** You may have to scroll through the font box to find Courier.
4	Select the **Regular** font style.
5	Select the **10 Point** font size.
6	Click on **OK** to close the dialog box.

Follow these steps to clean up the file format:

Step	Action
1	Delete words or messages before or after the field and load summary. Enter a title of your choice at the beginning of the summary. *NOTE: Include a date in your title line.*
2	Add or delete blank lines to insert page breaks at convenient points. *NOTE: Keep as much as possible of each field on a page.*
3	After you have cleaned up the summary format, click on **File** on the menu bar.
4	Click on **Save.**

Printing Field/Load Summary (Windows 95, 98)

Follow these steps to print the field/load summary:

Step	Action
1	Click on **File.**
2	Click on **Print.**
3	Click on **OK** to print all the pages

After you have printed the summary, review it for obvious errors in calibration, naming fields and loads, etc. Refer to the instructions in the Checking Data Accuracy document in this section for more information on reviewing the data.

To restart the PF3000, in the HyperTerminal program, hit the return key on your computer to get the message "Type PRINT, NAME, or START & press ENTER". Type START and press the enter key and the PF3000 will restart.

* * *

Before You Begin

After harvest season ends, remove the monitor from the combine cab. Use the provided 12-volt power supply to turn on the monitor in your house or shop and check the recorded yield data for errors. Options for checking the data follow:

- If you are using the GPS receiver and memory cards, print the season summary using a mapping software that will read yld files from the memory card.
- If you cannot print a summary, follow the instructions on these pages and use the monitor to check your data for accuracy.

Calibration

Any load for which you see an error listed in the **% Err** column of the summary is a calibration load. Check the following:

- Actual weight and grain type of each calibration load, ensuring that the loads are set correctly
- Load with a large error in the **% Err** column, which is any load with an error 5% or higher. Most loads should be 1% to 4% error.
- Loads with unusually large errors may need to turn off the loads as calibration loads by pressing the CAL ON/OFF key.

Refer to the Grain Weight document in the Calibration section for instructions on examining and correcting any errors.

If you do not have a summary print out, follow these steps to check the calibration errors on the monitor:

Step	Action
1	Press the Menu Key, CAL , WEIGHT, select the grain type and press SHOW CAL LOADS.
2	On the Grain Calibration screen for the selected grain type press PERFORM CAL.

Step	Action
3	Press CONTINUE when "PRESS CONTINUE TO RUN FULL CALIBRATION" appears on the display. **Note:** If you do not have four weights entered, press EXIT and then scroll through each calibration load and its calibration error to look for high errors.
4	When the monitor completes its full calibration, press EXIT to scroll through each calibration load and its calibration error to look for high errors.

Moisture

Review the Moist column in the printed summary. Review all the loads to verify that the moisture settings are correct. Note that each moisture reading has an "A" or "M" to the right of the reading.

- The "A" indicates the moisture setting for that load was automatic, and the monitor used the moisture readings from the moisture sensor.

- The "M" indicates the moisture setting for that load was manual, and the monitor used the average moisture that you entered.

Look for very high moisture readings (from buildup on the moisture sensor), particularly in soybean loads. If you see moisture values that are obviously too high, change the moisture setting to manual for those loads and enter a moisture value.

Step	Action
1	Press Menu Key, SETUP, LOAD
2	On the Load Setup screen, arrow down to Moisture Mode, press EDIT, arrow up to MANUAL, press ACCEPT.
3	On the Load Setup screen, arrow down to Manual Moisture, press EDIT, use the up or down arrow to enter the moisture value.

Look at the Dry % value on the printed summary for each field. This value is the moisture value the monitor uses to convert wet bushels to dry bushels (**example:** soybeans Dry % normally is 13%). Each grain type has one setting. Verify that for each grain type harvested, the Dry % value is set correctly. If it is not set correctly, change Dry % to the correct value.

Step	Action
1	Press Menu Key, SETUP, and GRAIN key
2	On the Grain Setup screen, arrow down to the desired grain type, press EDIT SETTINGS.
3	Arrow down to Dry Moisture, press EDIT, use the up or down arrow to enter the dry moisture value.

If you do not have a printed summary, look at the field and load averages on the monitor to check for high average moisture. Press the GRAIN key to check the Dry % value for each grain type harvested.

Acres

Check the number of acres for each field and load, ensuring they are correct. If you know the exact number, you can set the field acres that the monitor measured to the exact number of acres in the field. You can also change the load acres. Refer to the Acre Calibration instructions in the Acre Counting section for more information.

Grain Type

Review, each load in each field, ensuring it is set on the correct grain type. Refer to the Grain Type section for more information about changing the Grain Type.

Field/Load Name

Review all fields and loads, ensuring that you have entered the correct names. If you have not entered a name for a field or load yet, you still can.

NOTE: Enter a field name and number that identifies the same location year-to-year for more accurate management and comparison of field data.

Updating the Monitor

All changes made to the data in the monitor will automatically be saved to memory with the monitor is shut down. After making changes to the monitor data, print another summary.

Updating Field Maps

If you are using the GPS receiver and memory cards, press the Menu Key, SETUP, CARD, COPY TO CARD to copy memory to the card one last time to apply the final calibration and other settings to the GPS yield data.

Read this card into a program that will read yld data directly. Print the maps for each field.

NOTE: If you previously printed field maps but made large changes to your data at the end of the season (particularly calibration changes), print the maps again with the new data to ensure your maps are accurate.

Do not erase your fields until the next harvest season or until spring if you use your monitor with a sprayer or planting controller.

* * *

Introduction

Ag Leader Technology will offer free operating program upgrades to the PF3000 as new capabilities are added. The new operating program is a computer file that you must load into the PF3000. The name of the file will always end with ".pld"

> *NOTE: The latest upgrade file is posted on our Internet site,* http://www.agleader.com *You can also find upgrade files for all operating modes on the CD that shipped with your monitor.*

You can install the new operating program using a memory card or by connecting a computer to the PF3000. The recommended method of installing a new operating program is by using a memory card.

The version of operating program that the monitor is using is displayed when you turn on the PF3000.

Switching Operating Modes

With the exception of Site Verification Mode, all modes have their own upgrade file. Site Verification Mode is included with all other modes.

When switching modes, you have to install that modes upgrade file, unless you are switching to Site Verification Mode. For example if you have installed the Grain Harvest/Site Verification mode firmware, you must install the Application Rate/Site Verification mode firmware to switch to application rate mode.

The CD that came with your monitor has all the firmware versions for all the modes. You can also download them from the internet at www.agleader.com

After the correct firmware is installed, if you need to switch modes press SETUP key and CONSOLE key and change "Operating Mode" setting.

Note: When installing different firmware to switch modes, the version number should be the same. Your fields and loads and settings will not be lost when switching firmware versions.

Updating from a Memory Card

Step	Action
1	Using a computer and card reader, copy the file "upgrade.pld" from the floppy disk to the memory card. Delete all other files off the memory card.
2	Insert the memory card in the monitor and turn on the monitor.
3	The monitor will detect a new operating program on the card. Press the SHOW FILES key. The monitor will display the version number of the current program and new program. Press ACCEPT key to install the new version.
4	The monitor will erase the old program and install the new program.
5	Check some of the field/load information and settings to confirm that the new program is operating correctly.

Using The Serial Port Upgrade Utility for Windows 95

If you do not have a memory card and card reader available you can install the Serial Port Upgrade Utility program on your computer. This utility program enables your computer to transfer the (upgrade.pld) file to the PF3000 using the PC interface cable.

Note:
*The Serial Port Upgrade Utility program is available from **Ag Leader Technology** on the Precision Map 2000 V3.3 CD or by calling (515)-232-5363.*

Step	Action
1	Install the PF3000 Serial Port Upgrade Utility program on your computer.
2	After program has been installed in Windows 95 or Windows 98, click Start, Programs, PF3000 Serial.
3	On the Serial Port Upgrade Utility screen, click UPGRADE THE PF3000 button and follow steps on the screen.
4	Select a COM port number (usually COM1).
5	Switch PF3000 power OFF.
6	Connect PC interface cable to PORT 1 on PF3000.
7	Connect PC interface cable to the selected COM port of your PC (usually COM1).
8	Click CONNECT and switch the PF3000 power ON. “PC communication established” will be displayed on the monitor.
9	Click HERE to select the upgrade file. The upgrade.pld file can be selected from a floppy disk or a directory on the computer’s hard drive.
10	The file you have selected will be displayed, if that is the correct upgrade.pld file, click HERE in the bottom box to install.
11	The program will begin to prepare the PF3000 to receive. A bar with twelve boxes will light up one-at-a-time until PF3000 is ready to receive the file.
12	When file transfer begins a new screen appears with Bytes Transferred, Time Remaining, Percent Complete and Cancel to stop upgrading. **IMPORTANT: If you press cancel while the file transfer is in progress the PF3000 will not be upgraded and the monitor will no longer have an operating program. You will have to restart the serial port upgrade process or upgrade from a memory card.**
13	When file transfer is completed “Upgrade Completed Successfully” will be displayed in lower right hand box on the screen. Click EXIT then Yes, shut off the PF3000 and disconnect PC interface cable.
14	Turn on the monitor and verify the new program has been installed and is operating correctly

***

Introduction

Use the navigate function to return to a specific point in a field. You can navigate in any operating mode.

There are two ways to navigate:

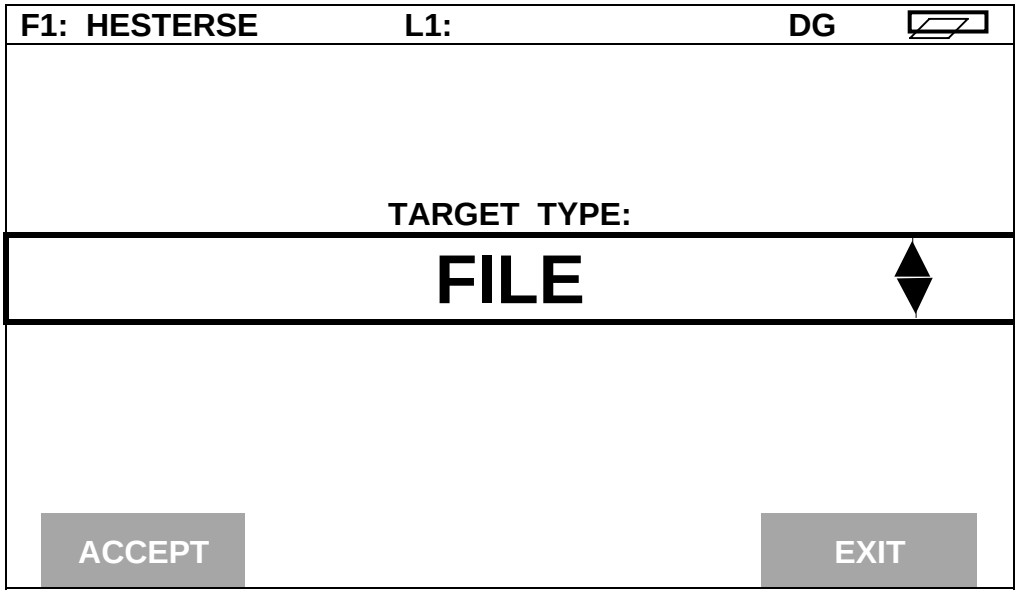
1. Navigate to points in a grid file (*.PFN).
2. Navigate to a latitude and longitude that you have manually entered.

The target points will display one-at-a-time while navigating. The display map scales to the navigation files scale, or a boundary file if available, or the scale between your current location and the entered LAT/LON position. The map will not re-scale as you move closer or farther away from the target.

You may log data in this mode by moving the Acre Count Switch to the UP position. The logged data is stored in a *.YLD file and data will be stored in the active field and load.

Navigate Screen

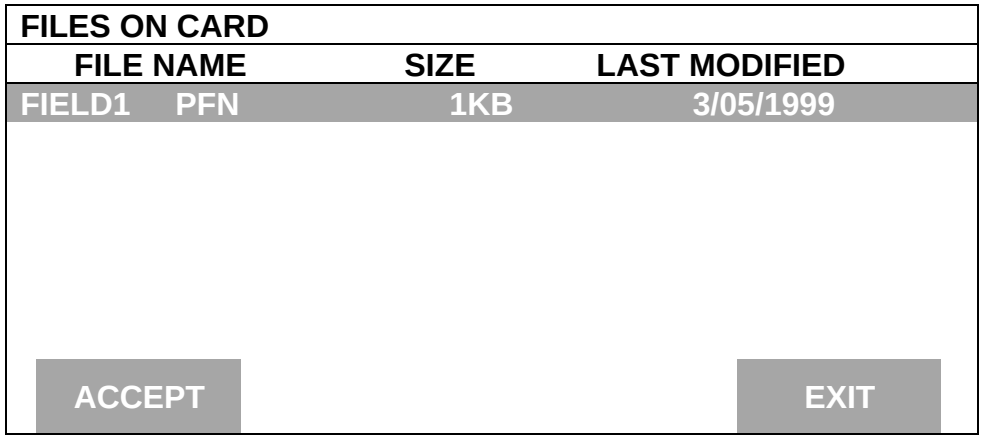
To use either navigate function, press the MENU key until OPTIONS is displayed and press OPTIONS key. Press the NAVIGATE key to display the following:



Navigate using a grid file

To navigate using a grid file complete the following:

Step	Action
1	Use the UP or DOWN ARROW keys an set target type to "FILE". Press the ACCEPT key to display *.PFN file (s) on the memory card.
2	Use the UP or DOWN ARROW key to scroll to the file you require and press ACCEPT key to display map.
3	Skip to the "Navigating to Point(s)" instructions to proceed to navigate to grid points

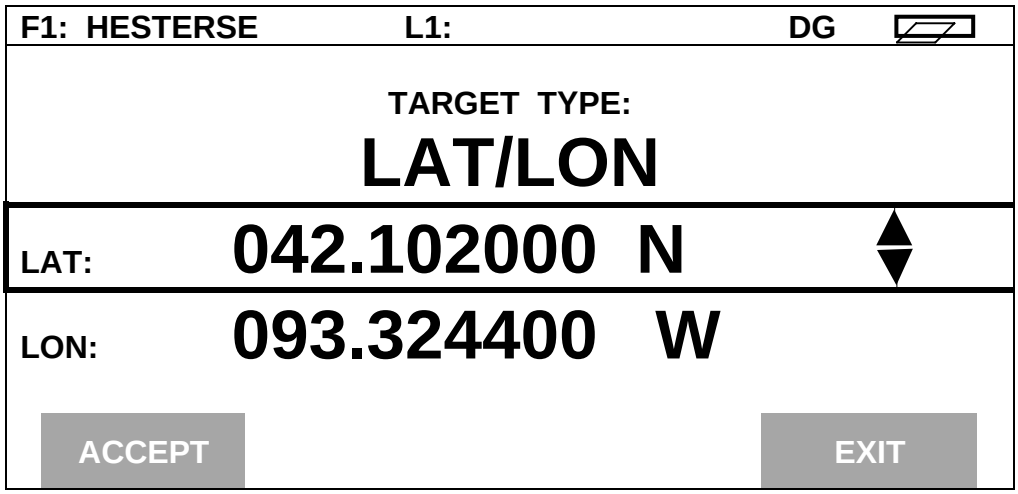


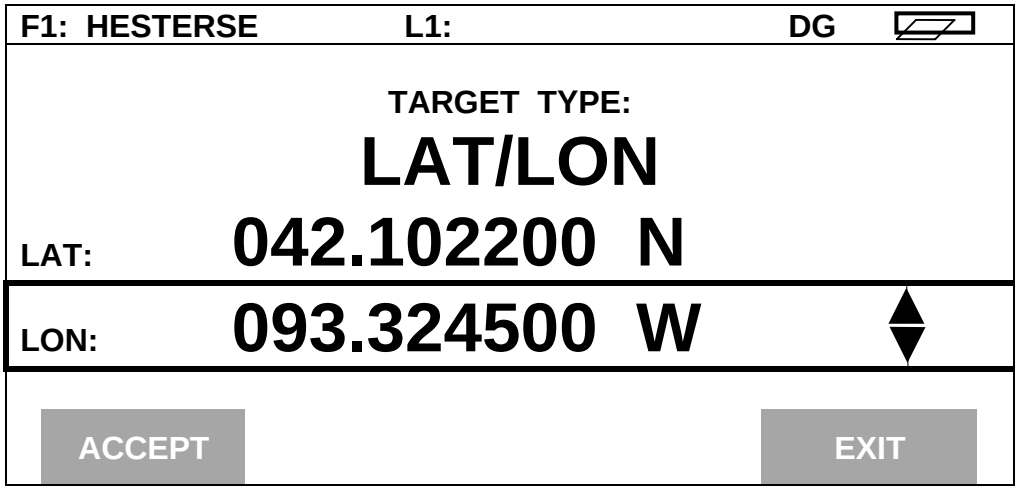
Navigate to manually entered point

The LAT/LON target should be entered when you have the antenna connected, the system is running, and you are in the general area of the target. The LAT/LON value will default to your current location, which will make it easier to input your target location.

To navigate using a manually entered LAT/LON complete the following:

Step	Action
1	Press the UP or DOWN ARROW key and set target type to LAT and LON.
2	Press key to the right of LAT line to highlight, use the UP/DOWN and LEFT/RIGHT ARROW keys to input the latitude and press ACCEPT key.
3	Press key to the right of LON line to highlight, use the UP/DOWN and LEFT/RIGHT ARROW keys to input the longitude and press ACCEPT key.
4	Press the ACCEPT key again to display map.
5	Skip to the "Navigating to Point(s)" instructions to proceed to navigate to grid points





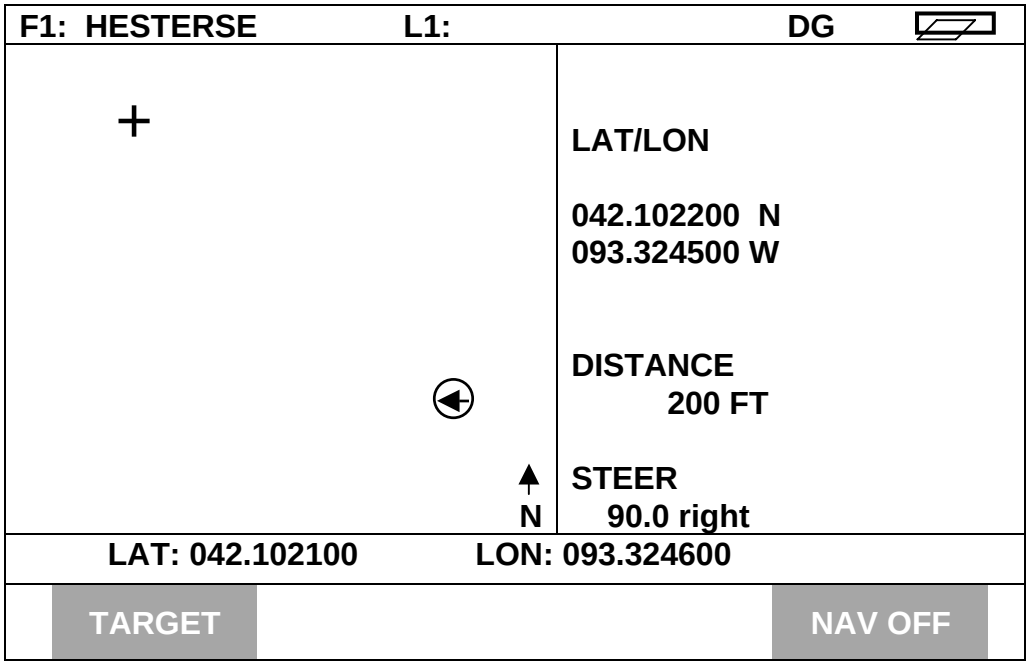
Navigating to point(s)

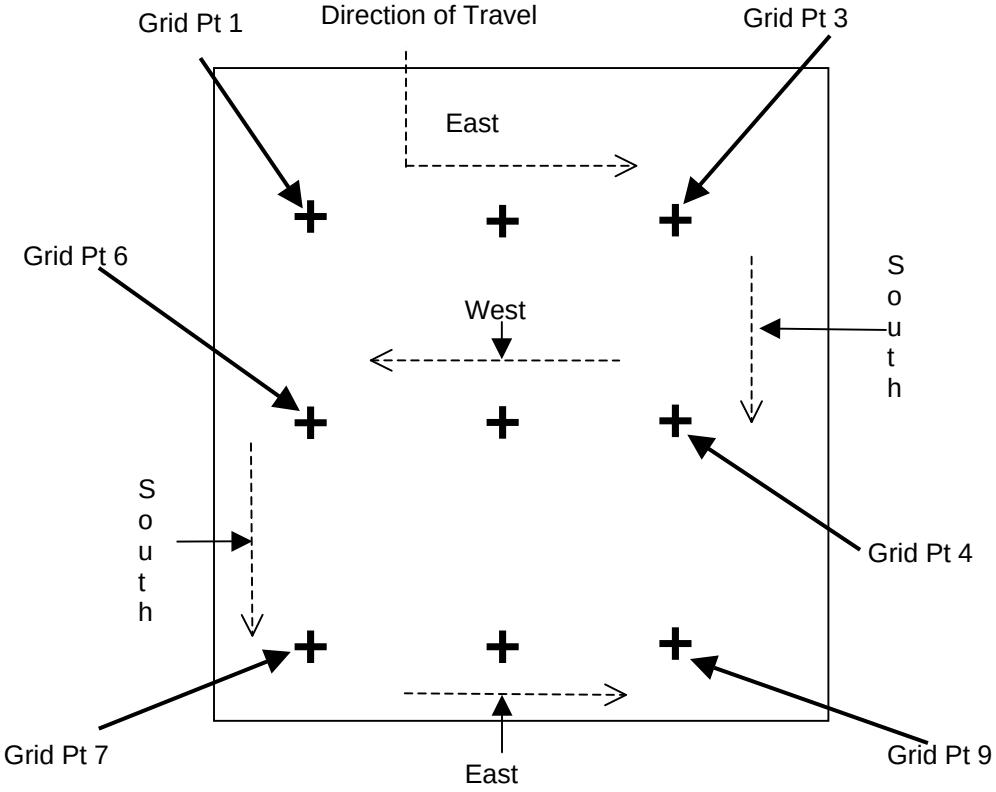
You can not change any of the display items on this screen.

The LAT/LON at the bottom of the screen is your current position and the LAT/LON display item is your target.

STEER information is displayed in degrees from your current travel direction to the target.

The target points will display one-at-a-time while navigating.





Example of navigating to grid points in order

NOTE: You can navigate to grid points in order or select any grid point at any time by pressing the UP or DOWN ARROW key.

Step	Action
1	Select the first grid point to drive to.
2	Use the DISTANCE and STEER information to accurately guide yourself to the target. When the distance gets to zero or near zero, you have navigated to the point.
3	If you are navigating from a file, press the UP or DOWN ARROW key to select the next grid point.
4	If you are manually inputting grid points, press the TARGET key and input the next LAT/LON point.
5	When you have completed navigating to each of the desired points, press NAV OFF, to return to the main screen.

***

Introduction

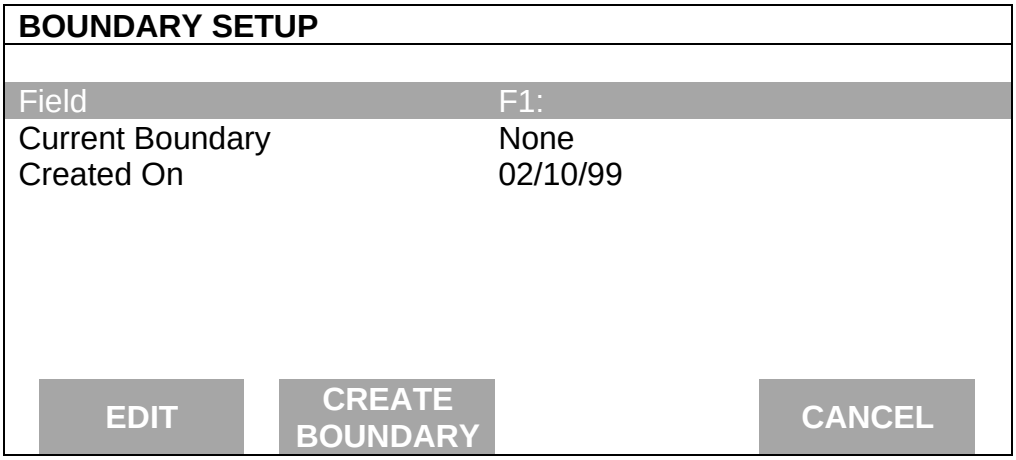
Using the GPS receiver, you can create a boundary file in any mode by driving around the outside of the field. If you create a boundary for all your fields and always keep the boundary files on your memory card, you will see the field boundary appear on the on screen map when you press SHOW MAP key. This is useful because you can show a map of where you have driven and a map of the field boundary at the same time. Boundary files are required to grid a field.

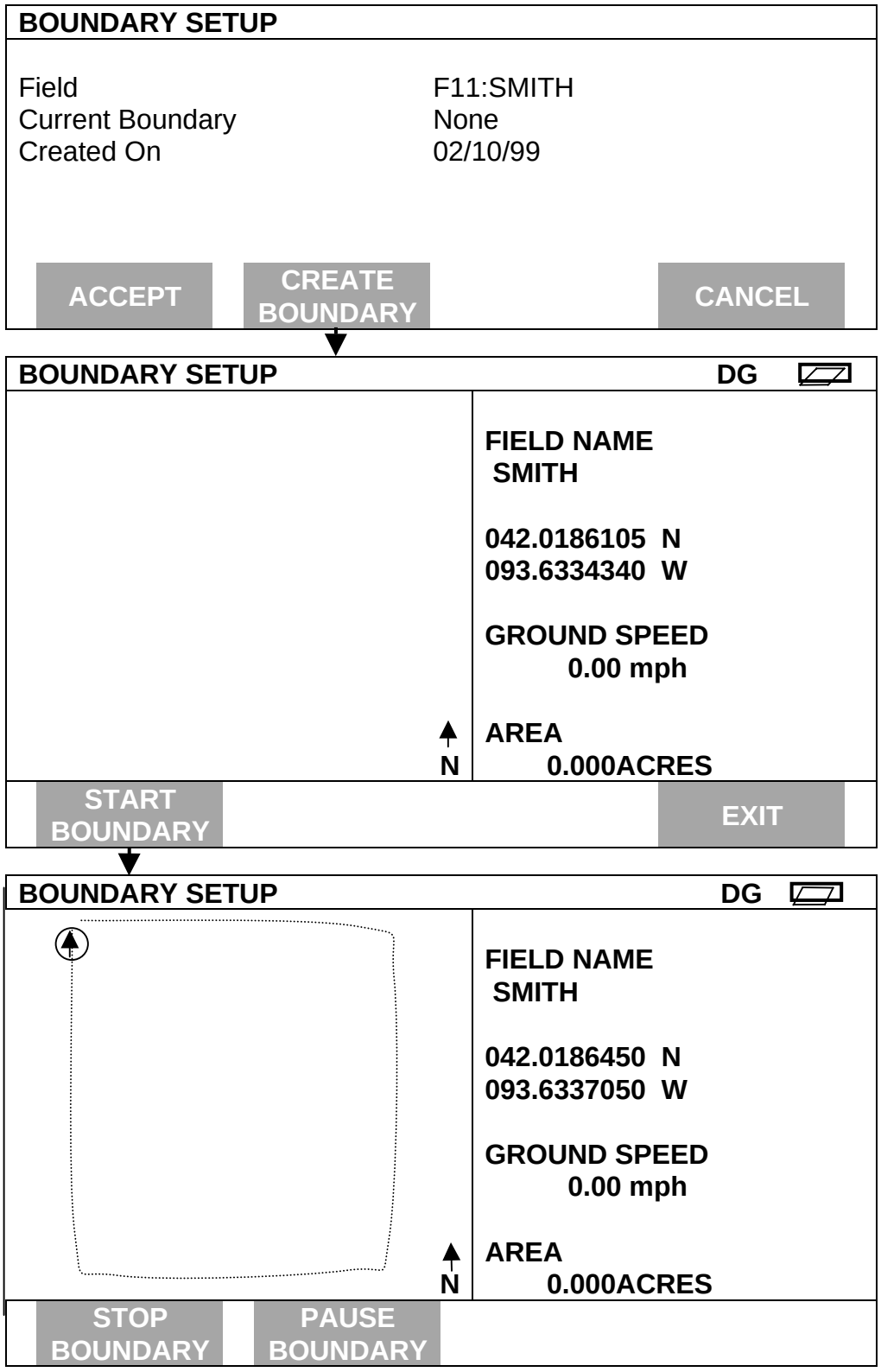
Boundary files are stored as *.BDY files on the card. Only one boundary file can be selected and displayed for a field. Sub boundaries can not be created or displayed for a field.

Boundary Setup Screen

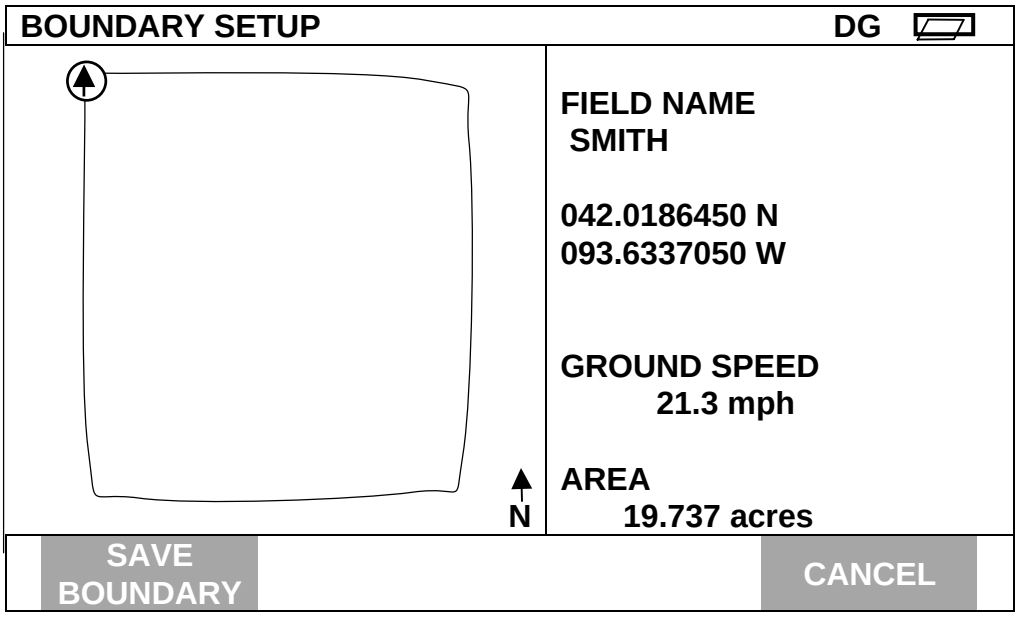
With a card inserted into the monitor, press MENU key until OPTIONS is displayed and press BOUNDARY key. Press the EDIT key to change to a different field from the one being viewed. After selecting the field press ACCEPT key.

NOTE: The area count switch must be in the down position before entering boundary setup screen.




BOUNDARY SETUP
Field
F11:SMITH
Current Boundary
None
Created On
02/10/99
ACCEPT
CREATE BOUNDARY
CANCEL
BOUNDARY SETUP
DG
FIELD NAME
SMITH
042.0186105 N
093.6334340 W
GROUND SPEED
0.00 mph
N
AREA
0.000ACRES
START BOUNDARY
EXIT
BOUNDARY SETUP
DG
FIELD NAME
SMITH
042.0186450 N
093.6337050 W
GROUND SPEED
0.00 mph
N
AREA
0.000ACRES
STOP BOUNDARY
PAUSE BOUNDARY

Step	Action
1	Position the vehicle at a starting point on the outside of the field.
2	Press START BOUNDARY key and drive the outside edge of the field.
3	Use the PAUSE/CONTINUE feature to drive around an obstacle (wet spot) without including the path around the obstacle in the boundary map. When you reach the obstacle, press the PAUSE key. Drive around the obstacle and press CONTINUE key. The PF will draw in a straight line across the void area in the boundary map.
4	When you have completed driving the boundary of the field, press the STOP BOUNDARY key. Then press the SAVE BOUNDARY key. *NOTE: You should drive back to the starting point before pressing STOP BOUNDARY key. If you do not, the area calculated for the field may be inaccurate.*
5	Press EXIT key and repeat above steps for other fields. Refer to the gridding instructions to grid the field.



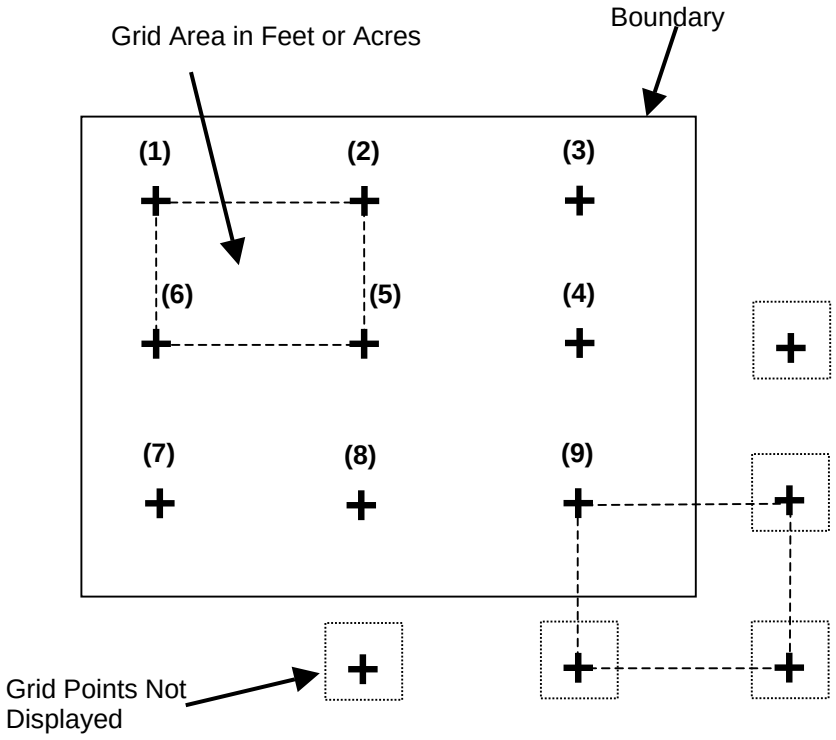
IMPORTANT: The Boundary and Grid screens are the only location where you can view the FIELD AREA information. If you come back to review information, DO NOT SAVE GRID OR BOUNDARY AGAIN. If you do this you will lose the boundary for this field. After reviewing the information, press EXIT key.

***

Introduction

To use this feature the PF3000 must be in Site Verification Mode. Before gridding, you must have a boundary file for the field. When using this feature, the entire PF3000 screen is gridded, but only the grid points inside the boundary will be displayed. The points are created with a preset name starting with Point 1 in the northwest corner of the field and ending in the southeast corner of the field. See example below. The order of points is from west to east, then south, then east to west, then south. The grid spacing may be set in either feet or acres. At this time, the grid points may only be shifted as a whole, not individually.

The PF saves the grid to a *.PFN file. At this time, the PF is the only device that can create a *.PFN file. ***Ag Leader Technology*** is working on an import/export file to convert *.PFN files to a format that can be used by mapping software companies. We are also encouraging third party mapping software companies to support this open format. Contact ***Ag Leader Technology*** for information regarding mapping programs that support *.PFN grid files.

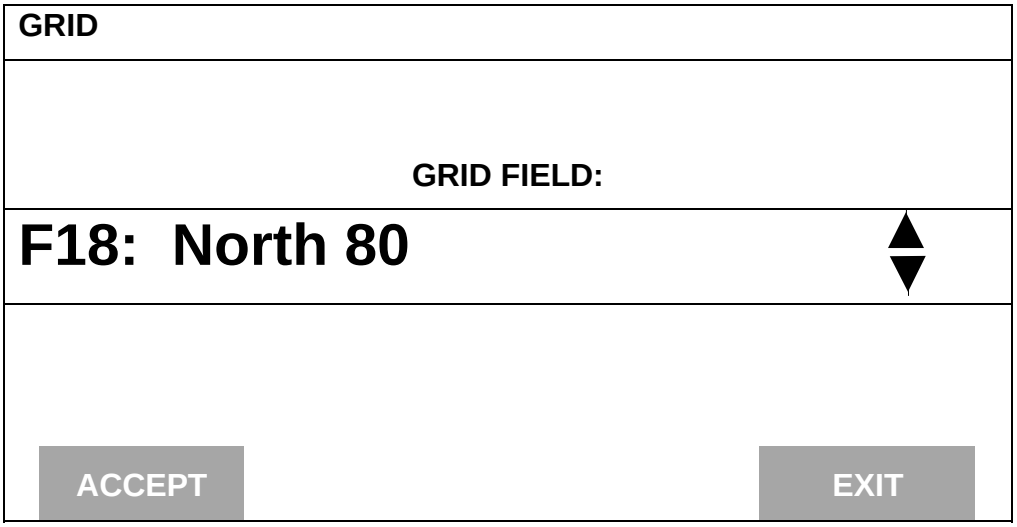


Gridding a field

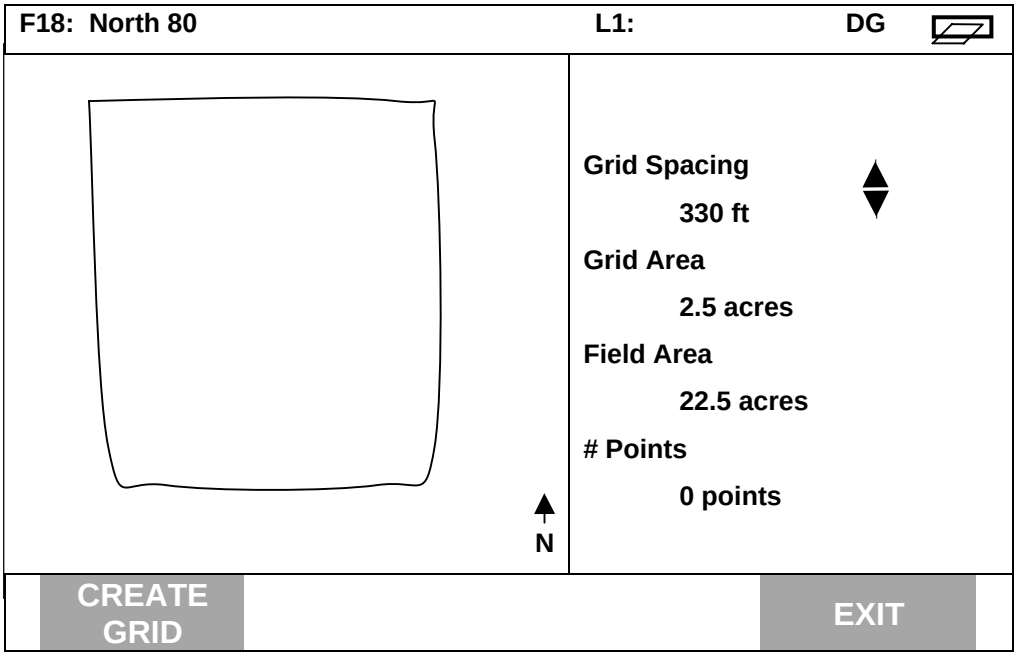
If you have not created a boundary file for a field, refer to the boundary instructions and create a boundary.

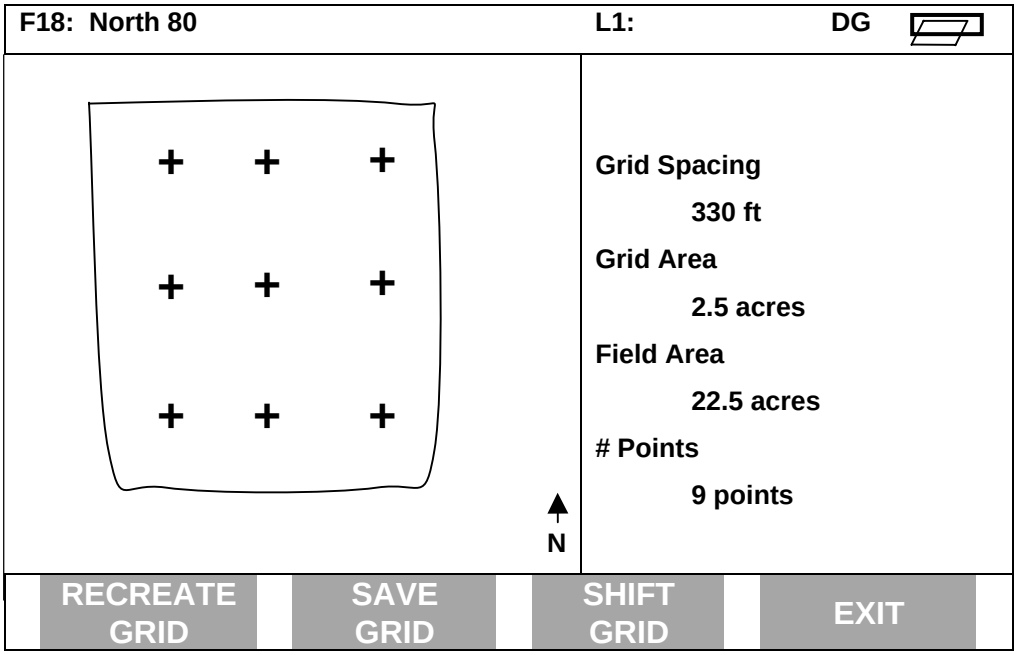
Press the MENU key until OPTIONS is displayed and press OPTIONS key. Press the LEFT or RIGHT small ARROW key until GRID is displayed and press the GRID key. A boundary must exist for a field to grid.

Step	Action
1	At the Grid Field screen, use the UP or DOWN ARROW key to move to the field you want to grid and press the ACCEPT key.

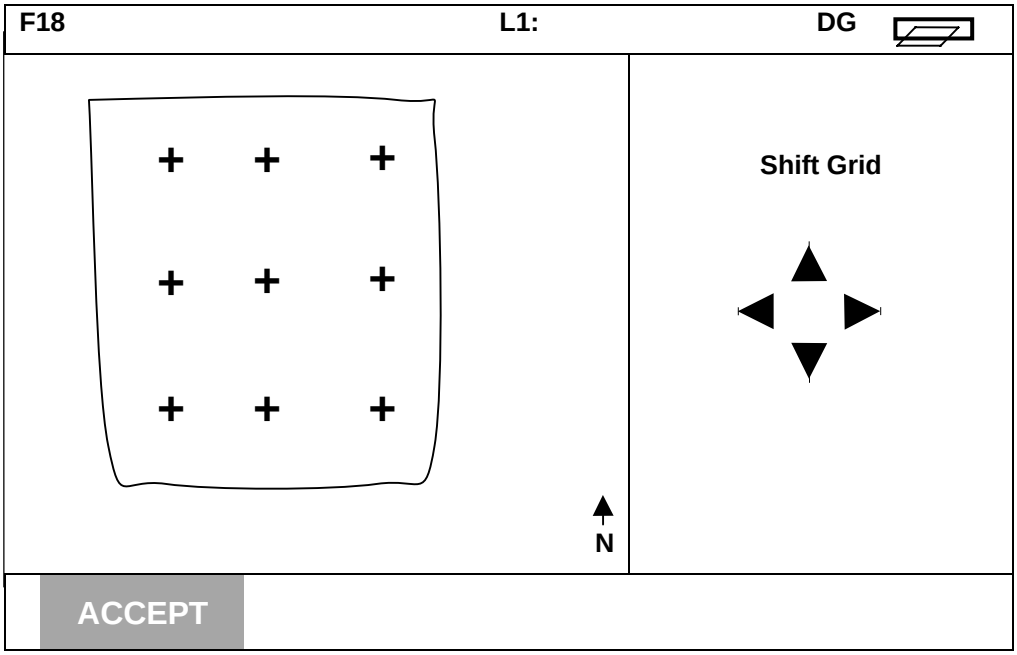


Step	Action
2	Press the UP or DOWN ARROW key to change the Grid Spacing and Grid Area. Pressing the UP or DOWN ARROW key changes both settings at the same time. Grid spacing increments are 10 ft.





Step	Action
3	After setting the grid spacing, press CREATE GRID key.
4	If you want to change the grid spacing or grid area, press the Up or DOWN ARROW key. Then press RECREATE GRID key to re-grid the field.
5	Press the SAVE GRID key to save the information to a *.PFN file.



By shifting the grid you can get points that were outside of the boundary, into the inside of the boundary. This may increase or optimize the sample location within a boundary. The grid only shifts in one pixel increments.

Step	Action
1	If you want to move an existing set of grid points, press the SHIFT GRID key. *NOTE: The shift grid screen only allows you to shift the entire grid and not individual grid points.*
2	Use the UP or DOWN, LEFT orRIGHT ARROW keys to shift the grid pattern, then press the ACCEPT key.
3	Press the SAVE GRID key to save the information to a *.PFN file.

IMPORTANT: The Boundary and Grid screens are the only place you can view the field area. If you come back to this screen after saving to review information, DO NOT SAVE GRID OR BOUNDARY AGAIN. If you do this, you will lose the boundary for this field. After reviewing the information, press EXIT key.

***

Introduction

Use the procedures on the following pages to troubleshoot, calibration, operation, and installation problems. If you cannot pinpoint the problem, call ***Ag Leader Technology*** at 515-232-5363 (fax: 515-232-3595).

If you think you have a hardware failure, call ***Ag Leader Technology*** and a service unit or replacement hardware will be shipped to you immediately.

Subject	Mode	Page
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Zero Flow in Bu/Hr	Harvest	6-6
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Moisture Readings of 5% or Erratic	Harvest	6-9
Moisture is too high or too low	Harvest	6-9
Moisture readings are high	Harvest	6-9
Moisture reading goes to 5%	Harvest	6-10
Moisture reading decreases drastically/suddenly	Harvest	6-10
Erratic moisture sensor signal with moisture sensor installed in auger tube	Harvest	6-10
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Auger doesn't come on moisture remains constant	Harvest	6-11
Average and Instantaneous Yield Do Not Agree	Harvest	6-11
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Monitor Has No Display	All	6-16
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No Marks on Map using External Field Marker	All	6-17
On Screen Map Does Not Appear	All	6-17

Problem	Cause	Solution
Bu/Ac or lbs/Ac Yield too high or low.	Average and instantaneous yields do not agree.	See "Average and Instantaneous Yield Do Not Agree" in this section..
	You are not counting the correct amount of acres.	Display AREA on the screen of the PF3000 to show the total acres. If they are incorrect for the field of load, see "Incorrect Acre Counting" in this section.
	Weight in pound is inaccurate.	See Incorrect Grain Weight (lbs) in this section.
	Moisture is inaccurate. Dry moisture is set incorrectly.	Display INST MOIST on the screen of the PF3000 to show the moisture. If it is incorrect, see "Incorrect Moisture" in this section. Press MENU, SETUP, and GRAIN. Select the grain type being harvested by using the up/down arrow keys. Press EDIT SETTINGS. Check the dry moisture value (percent moisture that dry bushels are reduced to. e.g. 13% for soybeans, 15.5% for corn). Use the up/down arrow keys to select the DRY MOISTURE line, then press EDIT. Use the up/down arrow keys to set the dry moisture to the correct value for the grain type being harvested. The monitor corrects the yields of previous loads harvested of that grain type.
	The load you are harvesting is set on the wrong grain type.	It is not possible to change grain type on an existing load. If an incorrect grain type has been selected, the entire field will need to be changed to the correct grain type. The load with the wrong grain type will remain in memory. There can be more than one-grain type for each field.

Problem	Cause	Solution
Bu/Ac or lbs/AcYield too high or low (cont.).	The top shaft of the grain elevator was adjusted during harvest to tighten the elevator chain.	Adjusting the top shaft of the grain elevator changes how the grain hits the flow sensor, and calibration becomes inaccurate. You must change to a different grain type and recalibrate the weight. **IMPORTANT: Use the lower elevator adjuster to tighten the elevator chain, instead of adjusting the top shaft. Make sure the top shaft is adjusted so there is ½ in. or less clearance between the tip of the paddle and the top of the elevator housing.**
	The dry lbs/bu setting is incorrect, causing bushels to be calculated incorrectly.	Press MENU, SETUP, and GRAIN. Select the grain type being harvested using the up/down arrow KEYS. Press EDIT SETTINGS. You can change the dry lbs/bu on every grain type except CORN (56lbs/bu), SOYBEANS (60lbs/bu), and WHEAT (60lbs/bu). For the other grain types, select the Dry lbs/bu row and then press the EDIT key. Change the value by using the up/down arrows. After the correct dry lbs/bu value is set, bushels and bushels per acre are corrected on all the loads set on that grain type. *NOTE: Set the dry lbs/bu only once. If you think the bushels are incorrect, troubleshoot the grain-weight calibration.*

Problem	Cause	Solution
Bu/Ac or lbs/Ac Yield too high or low (cont.)	The cab, distribution, or flow sensor cables connection is bad, or the flow sensor is bad.	Press MENU, DIAG and YEILD to check the Min/Max values and the Flow Offset. The Min value should be between 40 and 200, the Max value should be between 300 and 400. These values should never change while separator is running at full speed with no grain or with a grain flow. If Min/Max value is incorrect (e.g. Min=255, Max=0), or Flow Offset number is incorrect, check cab, distribution and flow sensor cable for loose connections or cable damage. Use a volt-ohm meter to check for correct resistance readings. See Checking Flow Sensor Connection Reference
	The Sensor Cal, Box Cal, or Voltage Cal number has changed.	To view the Sensor Calibration number, press MENU, SETUP, and VEHICLE keys. To view Box Cal, and the Voltage Cal number, press MENU, SETUP and CONSOLE keys. Check each value against the Initial Calibration Sheet. None of the values should change unless the monitor or flow sensor was changed. If the monitor or flow sensor was changed and these values not changed, all new loads must be set to a different grain type (e.g., CORN to CORN 3) and calibrate the monitor for grain weight and moisture for that grain type. To change the voltage, box or sensor calibration values, highlight the selection and then press EDIT to change the settings, using the up/down arrows to change the values.

Problem	Cause	Solution
Bu/Ac or lbs/Ac Yield too high or low (cont.)	The scale factor number has changed.	To view the Scale Factor setting, press MENU, SETUP, and VEHICLE keys. If the scale factor changed during harvest calibration accuracy will be lost. Recalibrate by changing to a different grain type and entering new calibration loads. The scale factor should be set to the value on the Initial Calibration Sheet, UNLESS: • Old calibration loads were saved from the previous year under a different scale factor setting. • Current calibration accuracy is satisfactory.
	The grain is not hitting the flow sensor because the flow sensor or stainless steel deflector plate is installed backwards	See your PF3000 installation instructions to ensure flow sensor and deflector plate are installed correctly.
	"Expand Grain Below Dry" is set to YES.	To view this setting, press MENU, SETUP and VEHICLE keys. If this setting is YES, any grain harvested below the dry moisture value will be increased to the dry moisture value before the yield is calculated. If the average moisture of the grain is below the Dry Moisture value, the yield in bu/ac will be higher than that calculated from the elevator. This occurs in soybeans where the moisture is often below the Dry Moisture value. To accurately compare the yield of different soybean varieties, increase the bushels to the Dry Moisture value. Use the up/down arrow keys to select "Expand Grain Below Dry" and press EDIT key. Use the up down arrow keys to select NO and press ACCEPT key.

Problem	Cause	Solution
Yield in Bu/Ac or lbs/Ac is Always Zero	Zero flow in bu/hr.	Push Display Selections key, push the right/left Menu Selection keys until GRAIN FLOW is displayed and push key. If the value is zero or erratic, refer to "Elevator Speed is Zero or Erratic" in this section
	Acres are not being counted.	Push Display Selection key, push right/left Menu Selection key until AREA is displayed and push key. If this is incorrect for the field of load, refer to "Incorrect Acre Counting" in this section.
Zero Flow in Bu/Hr or lbs/Hr.	Elevator speed is zero or erratic. *NOTE: Elevator speed must be between 250 rpm and 600 rpm or there will be 0 flow in bu/hr*.	Push Display Selection key, push the right/left Menu Selection key until ELEVATOR SPEED is displayed and push key. Engage the separator and harvest as you watch the elevator speed. The speed should maintain about 400 rpm without erratic change (jumps of 75± rpm). If the elevator speed is erratic or 0 or 600 rpm, refer to "Elevator Speed is Zero or Erratic" in this section.
	The clean grain elevator has excessive paddle tip clearance at the top.	Check paddle clearance between the tip of paddle and inside of the clean grain elevator housing as paddles rotate around the top sprocket. If clearance is more than ½ in. (1/2 in. or less id ideal) readjust the top shaft of the elevator and recalibrate. Change grain types and enter new loads and calibrate weight again.
	The C1 number (vibration calibration number) is too high and eliminating pounds of grain.	Press MENU, CAL and WEIGHT key. Press SHOW CAL NUMBERS to display C1 through C11 (C1 is vibration). If any of the C2 through C11 numbers are set to zero, select that C value and press EDIT key. Use the up/down arrow keys to set them to the values on the initial calibration sheet for that grain type. Press ACCEPT key. Calibrate the monitor for grain weight and the C numbers will automatically be set to their correct value for your combine.

Problem	Cause	Solution
Zero Flow in Bu/Ac or lbs/Ac (cont.).	Calibration number set to zero	Press MENU, CAL and WEIGHT key. Press SHOW CAL NUMBERS to display calibration numbers C1 through C11. If any of the C2 through C11 calibration numbers are set to zero, select that C value and press EDIT key. Use up/down arrow keys to set the values on the calibration sheet for that grain type, then press ACCEPT key. Calibrate the monitor for grain weight. The C numbers will set automatically to their correct value.
	The cab, distribution, or flow sensor cables connection is bad, or the flow sensor is bad.	Press MENU, DIAG and YEILD to check the Min/Max values and the Flow Offset. The Min value should be between 40 and 200, the Max value should be between 300 and 400. These values should never change while the separator is running at full speed with no grain or with a grain flow. If the Min/Max value is incorrect (e.g. Min=255, Max=0), or the Flow Offset number is incorrect, check the cab, distribution and flow sensor cable for loose connections or cable damage. Use a volt-ohm meter to check for the correct resistance readings. See "Checking Flow Sensor Connection" in the Reference Section for the correct resistance readings.
	The grain is not hitting the flow sensor because the flow sensor or stainless steel deflector plate is installed backwards	See your PF3000 installation instructions to ensure flow sensor and deflector plate are installed correctly.
	Grain flow is too low for the monitor to measure consistently.	This is a problem where flow of grain is small (1 to 2 lbs/sec, for example grass seed). If possible take a larger swath or drive faster during harvest. If this does not resolve the problem, call Tech Support (515-232-5363) for further support.

Problem	Cause	Solution
Incorrect Acre Counting.	Incorrect swath	See "Swath Setup" in the Setup Section and Swath Setting in the Operation Section for instructions.
	Distance is not counting correctly (mph is incorrect).	See "Incorrect Distance and MPH" in this section.
	Area calibration number is set incorrectly	Press MENU, CAL and AREA to display the AREA CAL number. This number should be set to 100 unless you have manually changed it to adjust the total acres. If it is set to a different number, it will count the percentage of acres the number represents. Use the up/down arrow keys to adjust the ACTUAL ACRES to the correct setting. Then press PERFORM CAL key to correct the AREA CAL number. *NOTE: Changing Actual Acres will change the Area Cal number to a value other than 100, but will correct the total acres for that field.*
	Distance and area counting are not activated.	Ensure the area count switch is in up position and the stop height number is set high enough so that when you lower the head, AREA ON appears in the lower right corner of the display. See "Area Count Always Off" in this section.

Problem	Cause	Solution
Incorrect Moisture *NOTE: There must be grain flow to have a moisture reading, otherwise the reading will always be 5 percent.*	Moisture has not been calibrated or the calibration is incorrect.	See "Calibrating Moisture" in the Calibration Section. Press MENU, CAL, MOISTURE, and ENTER MOISTURE to display moisture calibration. The Moisture Offset is normally between –8% and +8%. If the offset is not between these values calibrate moisture again. If you have calibrated the moisture at very high moistures (28% to 35%) and now are harvesting at lower moistures, it may be difficult to find a calibration offset number that is exactly correct for both ranges of moisture. You should either choose a calibration offset number that is close for both ranges of moisture or set all the high moisture loads to a separate grain type and enter a new calibration offset number for that grain type.
Moisture Readings of 5% or Erratic.	Bad connection or damaged moisture cable.	Check temperature reading. If it is –20 degrees there is a bad connection or cable damage. Check moisture sensor cable where it connects at the distribution cable and cab cable. Look for pins that have corrosion or any part of the cable that has nicks or may have been pinched.
Moisture is too high or too low.	Temperature calibration has not been performed.	See Calibrating Temperature in the Calibration Section. *NOTE: If the temperature calibration was incorrect and you correct it, check the moisture calibration again.*
Moisture readings are high.	Moisture sensor or auger tube has an accumulated sticky buildup.	Clean any buildup from the sensor blade and auger. If buildup is so severe that the moisture sensor will not stay clean adjust the moisture setting manually. See "Moisture Setting" in the Operation Section.

Problem	Cause	Solution
Moisture reading goes to 5%.	Ground strap on moisture sensor is not getting a good connection.	Ensure the ground strap touches bare metal where it contacts the sheet metal.
Moisture reading decreases drastically/suddenly.	Determine if reading decreases occur when using a business-band, two-way radio.	Move the radio antenna and cable as far from the moisture sensor and sensor cable as possible. If the antenna wire must cross the moisture sensor cable ensure it crosses at a 90-degree angle.
Erratic moisture sensor signal with moisture sensor installed in auger tube.	The flighting of the combine grain tank fill auger was not completely cut down to the shaft where the moisture sensor was installed.	Remove flighting completely to auger shaft where the moisture sensor installs
Moisture continually reads 5% with elevator mount.	Buildup on proximity switch causing auger to run constantly preventing the chamber around sensor from filling.	Remove wing nut at top of moisture sensor and remove sensor. Disconnect the power to the electric motor by removing the fuse. With a dry cloth, reach inside the slot for the moisture sensor and wipe off the proximity sensor.
	Proximity sensor is out of adjustment.	Remove the side cover on the elevator mount. Do NOT attempt to remove the sensor. Locate the potentiometer adjustment screw on the backside of the proximity sensor. Using a small screwdriver, turn the screw slowly clockwise until the unit turns on without any grain. Then turn the screw counterclockwise 4 full turns or 8 half turns. The motor should stop running. Replace the side cover.

Problem	Cause	Solution
Auger doesn't come on and moisture remains constant.	The elevator mount has lost power.	Inspect the power cable to ensure it is not cut or damaged. Check inline fuse. **IMPORTANT: Never replace a blown fuse with anything larger than 15 Amps.** Inspect battery connections. The wire with the inline fuse should be connected to the positive terminal.
Average and Instantaneous Yield Do Not Agree	The acre calibration is not set to 100%	The instantaneous yield does not account for the acre calibration number and thus can give a different yield from the average yield if the Area Cal number is much different from 100%. Press MENU, CAL and AREA to display Area Cal. See "Incorrect Acre Counting" in this section if the number is not 100%.
Incorrect Grain Weight (lbs)	Not calibrated for this grain type	See "Calibrating Grain Weight" in Calibration Section.
	Incorrect actual weight entered.	Press MENU, CAL, WEIGHT, and SHOW CAL LOADS. Scroll through the calibration loads and verify that you have entered the actual weight in the correct load and ensure the actual weight is correct. Remove any loads for which you know the actual weight is incorrect. After actual weights are adjusted calibrate the monitor again. See "Calibrating Grain Weight" in Calibration Section.
	Calibration numbers C1 through C11 are set incorrectly.	Press MENU, CAL and WEIGHT key. Press SHOW CAL NUMBERS to display calibration numbers C1 through C11. If any of the C2 through C11 calibration numbers are set to zero, select that C value and press EDIT key. Use up/down arrow keys to set the values on the calibration sheet for that grain type, then press ACCEPT key. Calibrate the monitor for grain weight. The C numbers will set automatically to their correct value.

Problem	Cause	Solution
Incorrect Grain Weight (lbs) (cont)	Calibration loads are set on the wrong grain type.	See "Calibrating Grain Weight" in Calibration Section.
	The result of increased or decreased in speed, harvesting a higher or lower field, or grain moisture greatly changes.	Weigh and enter one or two calibration loads for different field conditions. If monitor hasn't calibrated accurately after 10 to 15 loads at different grain flow rates, call Tech Support 515-232-5363.
	Clean grain elevator has excessive paddle tip clearance at the top.	Paddle clearance must be ½ in. or less. If more than ½ in. adjust the top shaft of the elevator and recalibrate by eliminating the actual weights and entering new ones or changing grain types and entering new actual weights.
Elevator speed is zero or erratic. *NOTE: Elevator speed must be between 250 and 650 rpm or there will zero flow in bu/hr.*	Electric header clutch not engaged.	Engage electric header clutch.
	Monitor set on wrong elevator pulses per revolution.	Press MENU, SETUP and VEHICLE. Elevator Pulses/Revolution appears at top of display. Refer to initial calibration sheet, then press EDIT and use up/down arrow keys to set pulses correctly.

Problem	Cause	Solution
Elevator speed is zero or erratic. *NOTE: Elevator speed must be between 250 and 650 rpm or there will zero flow in bu/hr.* **(cont)**	Elevator speed sensor is bad or monitor cables have a bad connection.	While harvesting, determine if the low-elevator-shaft-speed alarm is on. This indicates low or erratic elevator speed. If the alarm is on: • At elevator speed sensor cable, disconnect monitor elevator speed cable. If the alarms is still ON replace elevator speed sensor. • If the alarm goes OFF when cable is disconnected, inspect and reconnect cable. Inspect monitor cables for signs of pinching or cutting. Use a volt-ohm meter to check for shorts and continuity in elevator speed cable, distribution cable, and cab cable. Refer to Reference Section for proper readings.
	Ground speed and elevator speed extension cables have been interchanged.	On the distribution cable, look at the labels on the elevator speed and ground speed cables to ensure they are connected correctly.
Incorrect Temperature Reading	Temperature offset had been set to a large negative or positive number. *NOTE: this setting should be between –15 to 15 T OFFSET.*	Press MENU, DIAG and YEILD to display temperature calibration number (Temperature Offset). If this number is not between –15% to +15% calibrate temperature and recheck moisture calibration.
Incorrect Temperature Reading (cont.).	Cable connections are bad.	Disconnect cab, distribution and moisture sensor cables and inspect pins for corrosion. Inspect the cables for cuts or pinches. Reconnect cables and check temperature again.
AREA OFF Always Displayed *NOTE: The AREA ON must be displayed to count acres.*	Area count switch is in down position.	Area count switch must be up to make AREA ON appear on the screen.
	Stop height number is set too high.	Press MENU, CAL, STOP HGT and ENTER HEIGHT to display stop height setting. Adjust stop height so that when the head is raised AREA OFF appears on the screen. *NOTE: Stop height settings can be different for different grain types.*

Problem	Cause	Solution
AREA OFF Always Displayed *NOTE: The AREA ON must be displayed to count acres. (cont)*	Header sensor installed backwards.	Refer to Installation Instruction. Ensure header sensor is installed in the correct place with the correct orientation (cable toward the rear of combine, open end of black header sensor bracket pointing towards ground).
	Cable connections are bad.	Disconnect cab, distribution and moisture sensor cables and inspect pins for corrosion. Inspect the cables for cuts or pinches. Reconnect cables and check temperature again.
	Header sensor bad.	Check resistance of the header sensor between pins, A, B, and C on header sensor cable. Refer to Reference Section for correct resistance readings.
	Cable connections are bad.	Disconnect cab, distribution and moisture sensor cables and inspect pins for corrosion. Inspect the cables for cuts or pinches. Reconnect cables and check temperature again.
	Header sensor bad.	Check resistance of the header sensor between pins, A, B, and C on header sensor cable. Refer to Reference Section for correct resistance readings.
Monitor Chirps While Harvesting	Monitor is set on a partial swath.	Display SWATH on the screen. Use the up/down arrow keys to adjust to a full swath.
High Yield Reading After Stopping	C1 value (calibration number that eliminates false grain flow from vibration) must be adjusted.	Refer to "Calibrating for Vibration (C1)" in Calibration Section.
Incorrect Distance and MPH	Calibration for distance is incorrect or not been down.	Refer to "Calibrating Distance" in Calibration Section. After you calibrate for distance, the monitor automatically corrects any incorrect distance and acres for previously harvested loads. *NOTE: You must calibrate the secondary speed sensor setting if GPS is the primary speed sensor.*

Problem	Cause	Solution
Incorrect Distance and MPH (cont)	Monitor is set on the incorrect ground-speed setting.	Press MENU, SETUP, and VEHICLE to display Primary Speed Sensor. Use up/down arrow keys to correct the speed setting. If loads were set to the incorrect setting, change the loads to correct speed setting and the monitor will automatically correct acres and distance.
	Distance and acre counting is not activated because AREA OFF is displayed.	Move Area count switch to up position and the stop height number is set high enough so that when the head is lowered, AREA OFF changes to AREA ON. See "AREA OFF Always Displayed", in this section.
	Ground Speed Sensor has no signal or signal is erratic.	Refer to Installation Instructions to ensure that the combine ground speed sensor is installed correctly. Check combine ground speed readout while driving. Disconnect the ground speed cable from the ground speed sensor and check read out again. If readout is still erratic or zero, replace the ground speed sensor. Inspect the distribution and ground speed cable connections. Inspect the monitor cables for signs of pinching or cutting. Use a volt-ohm meter to check for shorts and continuity in the ground speed cable, distribution cable and cab cable. Refer to the Reference Section for readings. Determine that the ground speed sensor and elevator speed cables have not been interchanged.

Problem	Cause	Solution
Monitor has no display.	Cable connecting to monitor is disconnected or damaged.	Remove top nine screws securing the front panel and open. Inspect display cable for cuts or other damage. If cable is damaged, call ***Ag Leader Technology*** and send the monitor in for repair.
	An external device, such as a GPS receiver or datalogger is improperly connected to monitor.	Disconnect external devices and turn the monitor ON. If the monitor screen turns on correctly, make sure that he correct cable is used to connect the external device to the monitor. See "Using a GPS Receiver" or "Logging Map Data to a Datalogger" in the Operation Section.
	One of the PF3000 sensor cables has a bad connection	Disconnect the PF3000 cables from the distribution cable, one at a time, leaving the power cable connected. After disconnecting each cable, look at the display and see whether it has turned on.
No GPS Signal. *NOTE: "D" or "G" not appearing on the top right hand corner of PF3000 screen.*	The GPS receiver is not sending a signal to the monitor.	Some receivers require 5 to 15 minutes to acquire a signal after turning on the monitor. Inspect the cable from the GPS receiver to the antenna for damage and proper connection.
	Cable used to connect he GPS receiver to the monitor is incorrect.	If a cable designed for the PF3000 was not provided with the GPS receiver cable, obtain a GPS null modem cable from ***Ag Leader Technology***. **IMPORTANT: Do NOT use a null modem cable from a local store because it may be wired incorrectly and could damage the monitor or reset the memory in the GPS receiver.**
	GPS receiver cable connected to the wrong port on PF3000.	Ensure the GPS receiver cable is installed to Port 1 on PF3000.

Problem	Cause	Solution
No Marks on Map When using External Marker	GPS Check Sum setting need to be set to OFF.	*NOTE: For all **Ag Leader Technology** receivers (GPS 2000/21000, Add-On GPS 3000/3100) and Trimble 120, 122,132 receivers the GPS Check Sum should be set to ON.* For GPS receivers not listed in the above NOTE, the GPS Check Sum should be set to ON. If you can not get a "D" and "G", change this setting to OFF by pressing MENU, SETUP and CONSOLE. Use the up/down arrow keys to mark GPS Check Sum. Press EDIT and change the setting. Press ACCEPT and then EXIT.
	The Field Marker setting in the monitor is set to INTERNAL.	Press MENU, SETUP and CONSOLE keys. Scroll down to Field Marker Input and press EDIT. Use up/down arrow keys to change to EXTERNAL and press ACCEPT, then EXIT.
	Field Marker is plugged into the wrong port	Plug Field Marker into Port 1.
On Screen Map Does Not Appear	The log file containing that field's GPS data is not set as the current log file.	Press MENU, SETUP and CARD keys. Select Log File and press EDIT key. Select log file containing the field's GPS data and press ACCEPT key then EXIT. **IMPORTANT: If you change to different log file just to view a map of a field, make sure that after viewing the map you change the log file back to the original log file before you log more data.** *NOTE: If you have logged a fields GPS information on different log files you can only view a map from one of the log files GPS information.*

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* * *

Calculating Dry Bushels

The monitor uses the following equation to calculate dry bushels:

$$Wdg = \frac{(1-Mwg/100)}{(1-Mdg/100)} \times Wwg$$

Wdg = Weight (lbs) of Dry Grain
Wwg = Weight (lbs) of Wet Grain
Mwg = Moisture content of Wet Grain
Mdg = Dry% moisture

Example:

Wdg = ?	Wwg = 150,000 lbs
Mwg = 25%,	Mdg = 15.5%
Grain type = corn	Dry lbs/bu = 56

$\frac{(1-25/100)}{(1-15.5/100)} \times 150{,}000 = 133{,}136$ lbs dry grain weight

Wet Bushels = 150,000/56 = 2,679 bushels
Dry Bushels = 133,136/56 = 2,377 bushels

Shrink Factor

The shrink factor the monitor uses depends on the Dry% moisture you have set in the monitor.

$$\text{Shrink factor} = \frac{1}{1-Mdg/100}$$

Example:

$$\frac{1}{1-15.5/100} = 1.183 \text{ per point (difference between actual and dry\% moisture)}$$

Dry bushels calculated using the shrink factor can be found using the following equation:

$$\frac{Wwg - (S.F. \times (Mwg-Mdg)/100 \times Wwg)}{\text{Dry lbs/bu}} = \text{Dry bushels}$$

$$\frac{150{,}000 - (1.183 \times (25-15.5)/100 \times 150{,}000)}{56} = 2{,}377 \text{ bu}$$

* * *

Available Grain Types

Grain Type	Dry lbs/bu
Soybeans	60 (fixed)
Corn	56 (fixed)
Wheat	60 (fixed)
Oats	32 (changeable)
Rye	56 (changeable)
Barley	48 (changeable)
Sorghum	56 (changeable)
Popcorn	100 (changeable)(hundredweight)
Edibl Beans	60 (changeable)
Corn 2	56 (changeable)
Canola	60 (changeable)
Rice	45 (changeable)
Sunflowers	100 (changeable) (hundredweight)
Corn 3	56 (changeable)
Corn 4	56 (changeable)
Opt Grain 1	40 (changeable)

Available Grass Seed Types

Grass Seed Type	Scale Factor
Annual Rye	1
Perennial Rye	1
Fescue	1
Orchard Grass	1
Crimson Clover	1
Meadow Foam	1
White Clover	1
Bent Grass	1

* * *

Memory Cards

The following characteristics are required of memory cards you intend to use with the monitor:

- Type 1 or Type 2 PCMCIA (68-pin) SRAM memory cards
- Card sizes of .5 kilobytes and 1, 2, and 4 megabytes
- Memory cards with 200 nanosecond (ns) speed ratings are desired.

*NOTE: 1 Meg memory cards can be ordered from your **Ag Leader Technology** dealer.*

GPS Receiver

Almost all GPS receivers made for agriculture applications are compatible with the PF3000 and thus meet the requirements listed below. ***Ag Leader Technology*** sells a Coast Guard compatible receiver, the GPS 2000 and also a combined Coast Guard and Satellite differential compatible receiver, the GPS2100. The GPS receiver must be configured to send GPS data according to the following parameters:

- NMEA standard data output protocol
- 4800-X-8-1 communications protocol
- GGA data string—the only data string needed
- Send all messages once per second.

NOTE: If you use the Ag Leader GPS 2000/2100, Add-On GPS 3000/3100, Trimble AgGPS 120, 122, 132 or other high accuracy receiver that outputs the VTG data string, you can obtain ground speed readings from the GPS signal.

Radar Guns

Below are listed compatible radar guns:

Dickey-john
Magnavox
MicroTrak sonar gun
Case IH Magnum
John Deere

* * *

System Wiring

Refer to the last page to see a table of the pin-outs of the combine cables for the PF3000.

Checking Flow Sensor Connections

To check the flow sensor for electrical connection, use an ohmmeter and check for the following resistance's (readings can be 1-3 ohms off and still be good readings):

Check at:	Pins	Ohms
Cab Cable (rectangular 25 pin conn.)	9 + 21	350
Cab Cable (rectangular 25 pin conn.)	8 + 22	375
Distribution Cable (large round 24 pin conn.)	8 + 19	350
Distribution Cable (large round 24 pin conn.)	7 + 20	375
Flow Sensor Ext. Cable (round 9 pin conn.)	2 + 3	350
Flow Sensor Ext. Cable (round 9 pin conn.)	1 + 4	375
Flow Sensor Cable (round 9 pin conn.)	2 + 3	350
Flow Sensor Cable (round 9 pin conn.)	1 + 4	375

Pin-Out of Port 1

Pin	Signal
1	**Regulated 5 volts** (limit current draw to 50 ma)
2	**RS-232 Transmit** (from monitor)
3	**RS-232 Receive** (into monitor)
4	**12 Volt Power** (switched, reverse polarity protected, limit current draw to 1 amp) The PF3000 must be ON for current to flow.
5	**RS-232 Ground**
6	**Ground**
7	**Second RS-232 Transmit** (not in use)
8	**Second RS-232 Receive** (not in use)
9	**Auxiliary A/D Input** (keep input voltage between ground and 5 volts)

Checking Header Sensor Connections

To check the header sensor for electrical connection, use an ohmmeter and check for the following resistance's:

Check at:	Pins	Ohms
Cab Cable (rectangular 25 pin conn.)	11 + 18	100-200
Cab Cable (rectangular 25 pin conn.)	10 + 18	700-1000
Cab Cable (rectangular 25 pin conn.)	10 + 11	1000
Distribution Cable (large round 24 pin conn.)	10 + 16	100-200
Distribution Cable (large round 24 pin conn.)	9 + 16	700-1000
Distribution Cable (large round 24 pin conn.)	9 + 10	1000
Header Sensor Cable (rectangular 3 pin conn.)	A + B	100-200
Header Sensor Cable (rectangular 3 pin conn.)	B + C	700-1000
Header Sensor Cable (rectangular 3 pin conn.)	A + C	1000

* * *

Signal	PF3000 Rectangular 25 pin	Cab / Distrib. Round 24 pin	Power Rectangular 3 pin	Ground Spd Rectangular 2-pin	Elevator Spd Rectangular 2 pin	Moisture Round 14 pin	Flow Round 9 pin	Header Rectangular 3 pin
Power (14V)(US)	1	1				9		
TXA	2	-						
RS(485A)	3	2				8		
Moist2 (-)	4	3				7		
Temp	5	4				12		
SP1	6	5			A			
SP2	7	6		A		13		
A5V	8	7					1	
QMinus	9	8					3	
GND	10	9						C
Vcc (+5V)	11	10						A
D12V	12	11				1		
Power (14V)(S)	13	12	A					
RS(485B)	14	13				10		
RXA	15	-						
Moist1 (+)	16	14				6		
Field Marker	17	15				11		
HDR	18	16						B
SP3	19	17			B			
SP4	20	18		B		14		
QPlus	21	19					2	
AGND	22	20					4	
GND	23	21				4 & 5		
Vcc (+5V)	24	22				2 & 3		
GND	25	23	C					
Drain	shell	24					5	

Parts List for PF3000 Console Kit		
Part Name/Description	**Part No.**	**Quantity**
PF3000 Console Kit	3001300	1
PF3000 Electronic Unit	3000110	1
CD –ROM – Ag Leader Software Suite	2001601	1
Power Supply Kit (1 Amp) – Ag Leader	2000942	1
PC Cable Kit	2000492-1	1
Manual – Generic PF3000	3000112-G	1

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PF3000 Owners Registration

The PF3000 is an upgradable product. You will not receive free operating program upgrades unless you send in this registration form.

Return this sheet in the enclosed postage-paid envelope or by fax.
515-232-3595 - fax

Ag Leader Technology
2202 South Riverside Drive
P.O. Box 2348
Ames, Iowa 50010

Name: _____

Street Address: _____

City, State, ZIP: _____

Phone # (including area code): _____

Mobile Phone #: _____ Fax #: _____

Email Address:_____

Intended Use (Please circle all that apply): Combine Sprayer Planter ATV

Other, please specify_____

Ag Leader Dealer:_____

Dealer Address:_____

Combine Model #: _____ Combine Serial #: _____

PF3000 Serial #: _____ Flow Sensor Serial #: _____

Elevator Mount Serial #:_____