

**SERVICE  
ADVANTAGE  
MODEL 575  
MANUAL**



**FLIGHT SYSTEMS®**

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## Overview

### Standard Version

Service Advantage standard version provides features to:

- Retrieve logger data from the flash ram,
- Maintain the flash ram disk for re-installation in the field logger hardware,
- View the logger data in text format,
- View the logger data graphically charted over a date/time x axis and
- Print graphical charts.

Viewing features include text and graphic chart displays, showing date and time stamped alarm logs and engine sensor data logged directly from individual flash ram disks.

Text displays are viewed in a grid format providing the viewer with scroll bars to review alarm and data values logged at specific dates and times.

Chart displays default displaying all engine sensors allowing the user to override the default and select specific engine sensors for chart display. Navigate the chart using scroll bars moving the chart display ahead or backwards in time incrementally in large or small jumps or simply by sliding the scroll bar. A zoom feature is included to display additional detail of a selected section of the chart. A balloon text feature is provided to display data readings per chart point.

Print features are included to produce a hard copy of a chart data range shown on the screen.

The print features allow printer selection and simple printer configuration of print style including landscape or portrait and color or gray scale print. Simply modify the margin settings to size and position your chart on paper.

Utilities features include retrieving data for display from the flash ram disk and formatting the ram disk to prepare for a new data collection period.

### Database Version

The database version of Service Advantage includes all the features of the standard version listed above along with the ability to:

- Create and maintain databases to accumulate historical data from multiple engines,
- Chart engine pressure data in relation to RPM values,
- Produce statistical analysis reports (min, max and average) and
- Engine run time in relation to engine work time.

After reviewing the data logged on the removable flash ram disk, the user can select to add the latest data to an existing database or to create a new database. This feature provides history to track engine performance over longer periods of time.

The database information is saved on your computer and available for review and analysis at any time.

## System Requirements

### Computer Hardware Requirements:

COMPUTER: Pentium 166 or higher  
MEMORY: 64 MB Ram  
HARD DISK: Minimum Installation space 10 MB  
DISPLAY: graphic adapter supporting 600 x 800 resolutions  
MOUSE: PC Compatible two button mouse  
PCMCIA: Type II card slot  
Or  
External flash card reader (USB or Diskette Type)  
CD: 4X or higher

### Windows Software Requirements:

OPERATING SYSTEM: Windows 98/2000/XP  
SUPPORTING SOFTWARE: ODBC 32 Version 3.5  
Minimum Support Installed: MS Text Driver  
MS Excel Driver  
Excel 97 or better  
With Support for Data Access Links  
ODBC Add-in  
Update Links  
Office Tools – Microsoft Query

REGIONAL SETTINGS: Date: hh:mm:ss tt or HH:mm:ss tt  
Time: MM/dd/yyyy

### Changing the Regional Time and Date settings:

Go to Start - Settings - click on Control Panel and double click on Regional Settings in Windows 2000 or Regional and Language Settings in Windows XP and follow the procedure below:

#### Windows 2000:

Time: On the Time Tab, click on the Time Format pull down menu and choose the appropriate time setting hh:mm:ss tt for Standard or HH:mm:ss tt for Military.

Date: On the Date tab, click on the Short date format pull down menu and choose MM/dd/yyyy.

#### Windows XP:

On the Regional Options Tab, click on the Customize button.

Time: On the Time Tab, click on the Time Format pull down menu and choose the appropriate time setting hh:mm:ss tt for Standard or HH:mm:ss tt for Military.

Date: On the Date tab, click on the Short date format pull down menu and choose MM/dd/yyyy.

## Software Installation

It is strongly recommended that you close and exit all Windows 98 programs before running the Setup.

To Install Service Advantage:

Insert the CD-ROM into the CD drive. Windows 98 automatically loads and runs the Setup program.

If your Windows 98 or higher is not configured for Auto Run you will need to manually run the setup.

Click on the Start button, select Run and enter the following using the drive letter of your CD

D:\setup.exe

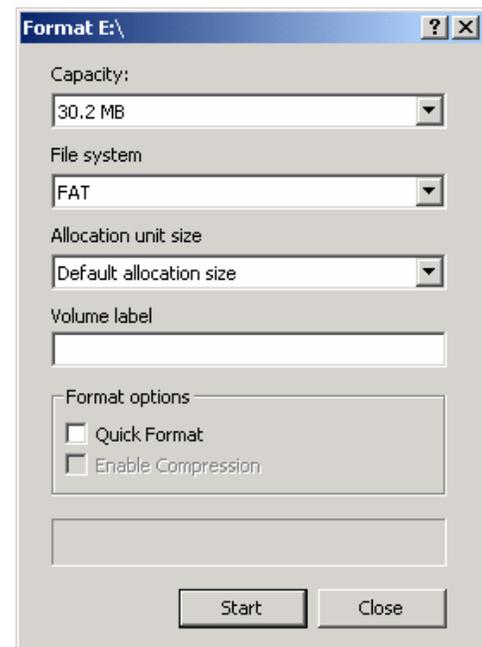
Follow the prompts for Next, Back, Cancel and Finish throughout the installation process.

### Formatting a Compact Flash Card:

Before a Compact Flash card can be used, it must be formatted to insure it will function properly in the Model 575. Use only Sandisk and approved Compact Flash cards.

1. Insert the Compact Flash card into the card reader
2. Start the Windows Explorer
3. Right click on the  Removable Disk (E:) and click on Format, the window pictured on the right will appear
4. Set the File System to FAT if not already set
5. Click the Start button
6. When the popup window appears, click OK
7. Click the Close button

Note: to ensure that a Compact Flash card is approved, it must have a symbol on the front or back like the one below.

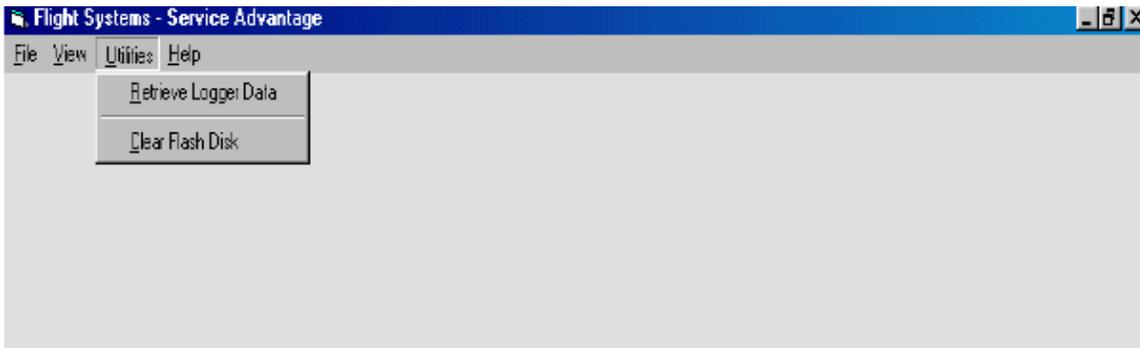


## Getting Started

Open the Service Advantage software by clicking the desktop icon



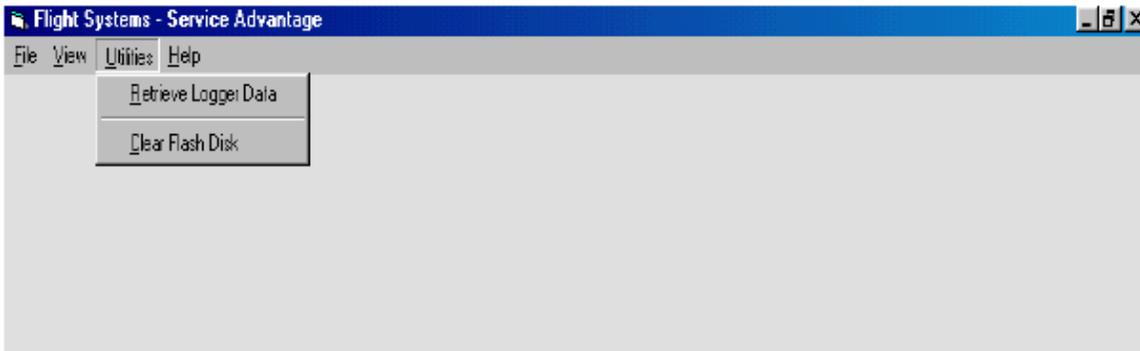
The main screen will be displayed; you can select how to proceed by using the drop down menu system.



Menu item selections available:

- File            Exit
- View            Logger Files
- Utilities        Retrieve Logger Data  
                  Clear Flash Disk
- Help            Contents  
                  About

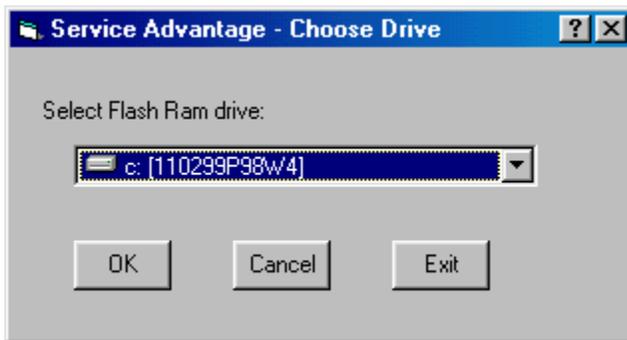
## Retrieve Logger Data



Before you can display your data you must select to Retrieve Logger Data from the Utilities drop down menu.

Depending upon the hardware installed in your computer, the flash ram disk may be automatically located. If you have more than two drives including the flash ram drive, you will be prompted to locate the correct drive letter before the data can be located and prepared for viewing.

If more than two drives are installed on your computer, a drop down list of all drives is provided. Select the correct drive letter of the flash ram disk and click OK to continue. If you do not recognize any of the drive letters or decide not to proceed, simply click Cancel or Exit.



The software will test the drive selected to determine the logger files are present. If the data files are found on the selected drive, the logger files are collected and validated for use in your chart display. While this process is being performed the cursor will appear as an hourglass.

When the data retrieval process is complete, a message box will be displayed telling you the data has been successfully retrieved. Simply click the OK button to proceed.

When the data is ready for display the cursor will return to your normal cursor style. In most cases this will be the arrow cursor.

You are then ready to display the data that has been logged to the flash ram.



### If Errors Occur during Retrieval

There are several reasons an error could occur during the retrieval process.

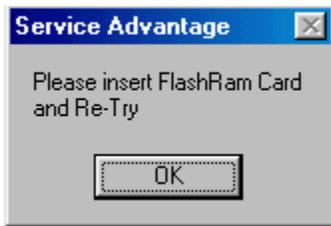
The most common error will be the flash ram disk is not inserted in the reading device.

Another error that may occur is that no logger data files are found. A possible reason is the wrong flash ram disk was inserted in the flash ram reader.

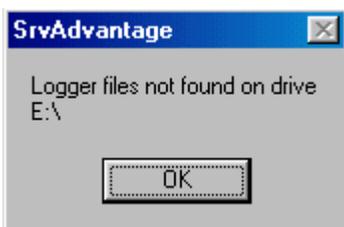
In both the above cases, a message will be displayed to indicate the possible problem.

## Data Retrieval Errors

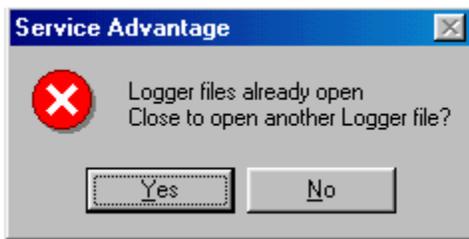
There are multiple reasons an error could occur during the retrieval process. The most common error will be the flash ram disk is not inserted in the reading device.



The retrieval process will not perform unless specific data files are located on the flash ram disk. If the file is not found on the disk and error message will be displayed.



An error occurs when you select Retrieve Logger Data and you have already loaded the logger data. A message will be displayed asking if you would like to close these files and open a different logger file.



If you selected to retrieve the data in error, simply click No. The continue by selecting to

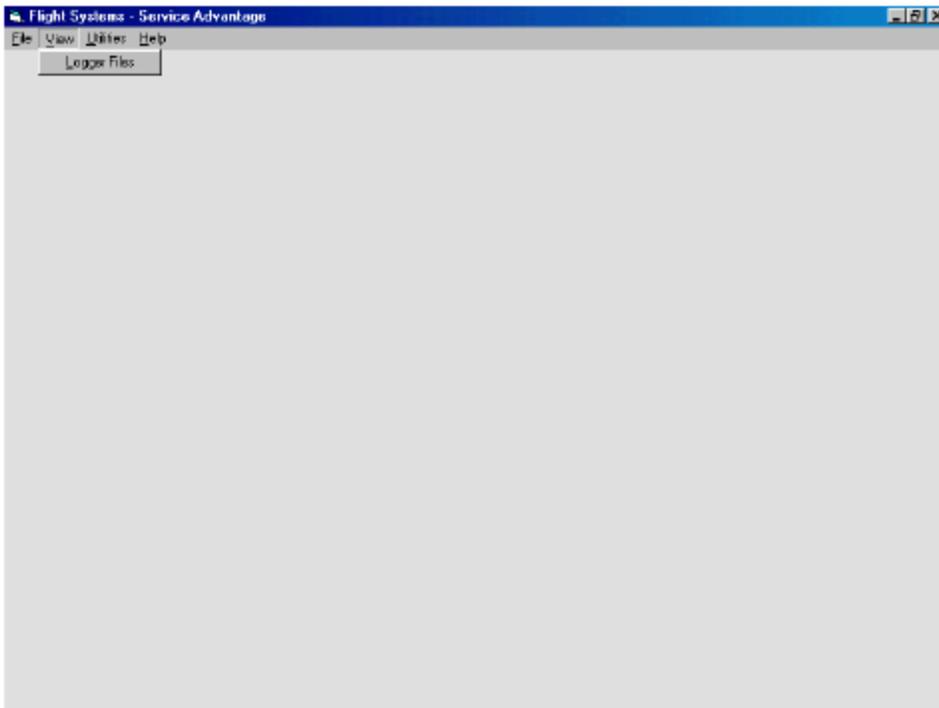
View the Logger Data.

If you would like to insert another flash ram disk from another engine, simply click Yes. Be sure you have already inserted the next flash ram disk. The retrieval process starts immediately after pressing Yes. If you left the same flash ram disk in the reader, simply let the process complete and repeat the process being sure to insert the new flash ram disk before clicking Yes.

If a file on the flash ram disk is found corrupted, the Service Advantage software should continue to retrieval as much data as possible. The exception to this would be if the main data file would become corrupt. If you would encounter this error, it may be possible to perform file recovery procedures to repair the file. This should not be a normal occurring error.

Errors encountered that have not been mentioned here should be reported. Be sure to note as precisely as possible the operating circumstances under which the error you are reporting occurred.

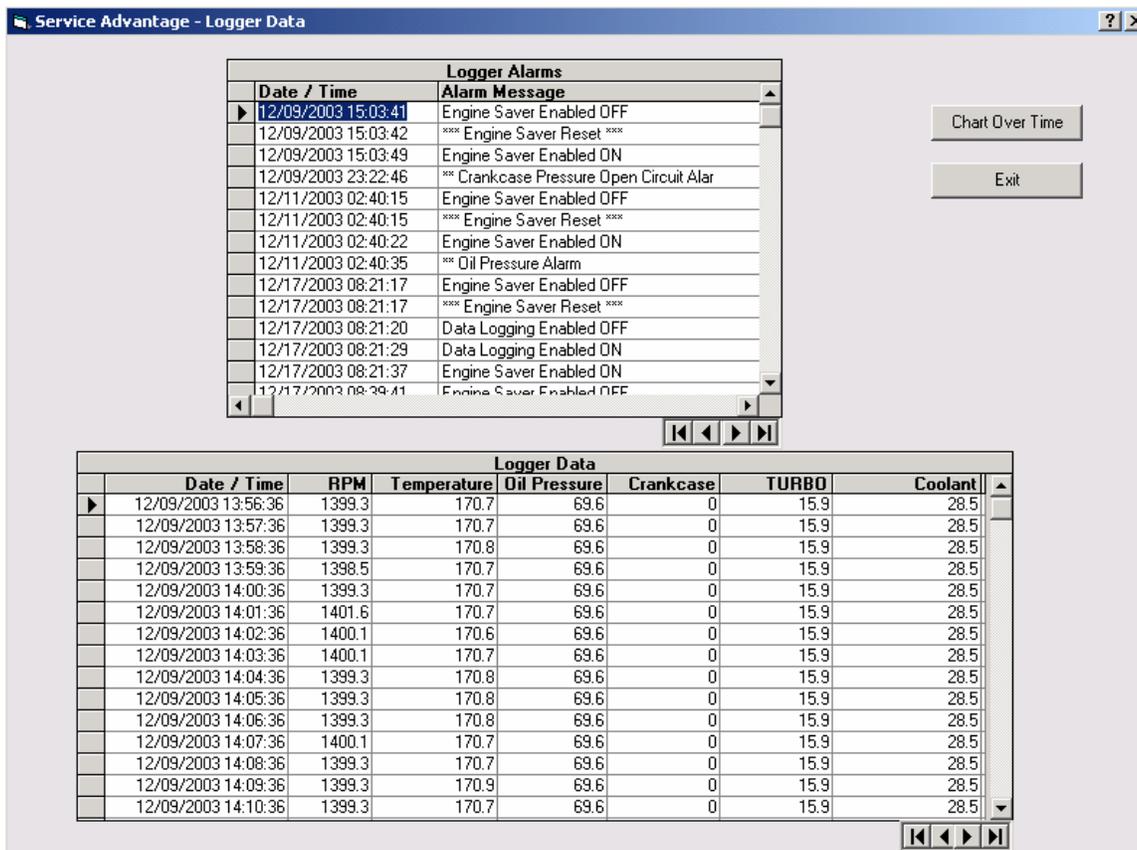
## Displaying Data



To display the data retrieved from your flash ram disk, select the View menu and click Logger Files.

The logger data will be displayed in a text grid format. An alarm date and time line (top grid) must be selected before choosing to display a chart, Chart Over Time.

The display screen includes a question mark in the upper right hand corner. If you click the question mark with the left mouse button, move to a location on the screen, and release the mouse button, context help is available describing what to do or what is displayed on the screen. To remove the help box, simply move your cursor to a blank area of the window and click the left mouse button.



### Minimize the Window:

If you would need to minimize the display window, grab the title bar, Flight Systems – Service Advantage, by placing the cursor over the title bar, depress the left mouse button and drag the window to the bottom of the screen. Then just click in the desktop area or click on a different program that might be minimized on the task tray.

To display the Logger Data window again, simply locate the window on the task tray and click to maximize the display. It may be necessary to drag the window to the top of the screen.

### Exit Window:

The best method to exit the display of text grids is to click Exit. This will provide the best performance of the software and an orderly shutdown of all data files.

### Viewing text grid data:

To review the Logger Alarms (top text grid), simply drag or click the vertical scroll bar.



The Logger Data values (bottom text grid) can also be reviewed by using the vertical scroll bar to navigate through the data retrieved from the flash ram disk. To quickly move from the top of the grid display (earliest data) to the bottom of the grid display (most recent data) click either the left or right side of the data control box.

If the logger alarm display contains an alarm that you would like to review the text data for that time period, simply double click in the left hand gray margin of the alarm grid where the black

arrow is located. Be sure to double click the left mouse button to select the alarm. This will position the logger data display (bottom grid) to approximately 10 minutes previous to the selected alarm date and time. Then scroll through the logger data points (bottom grid) using the scroll bar.

Viewing a graphical chart:

You must select a time period from the Logger Alarms text grid display to produce a chart. This selects the time period that will first be displayed in the graphical chart window.

Chart time periods are not selected in the Logger Data grid.

Only by double clicking on an alarm line can you select a date and time range to display a chart of your data.

This feature is designed to help you quickly locate the data values that have caused the alarm.

You may also just double click the first line of the Logger Alarms grid to place the chart display at the beginning of the data points retrieved from the flash ram disk.

If you select to Chart Over Time without previously selecting a time period, an information message will be displayed. Simply acknowledge the message by clicking OK. Then, double click a line in the Logger Alarms grid and select Chart Over Time.



## View Logger Data

To view logger data you must first have selected to Retrieve Logger Data from the Utilities menu. After the data has been successfully read from the flash ram disk, select View from the main menu and click Logger Files.

The following screen is presented.

The screenshot shows the 'Service Advantage - Logger Data' window. It features two data grids. The top grid, 'Logger Alarms', lists various engine events with their dates and times. The bottom grid, 'Logger Data', provides a detailed view of engine parameters over time. Navigation and control buttons are present on the right side of the 'Logger Alarms' grid.

Logger Alarms	
Date / Time	Alarm Message
12/09/2003 15:03:41	Engine Saver Enabled OFF
12/09/2003 15:03:42	*** Engine Saver Reset ***
12/09/2003 15:03:49	Engine Saver Enabled ON
12/09/2003 23:22:46	** Crankcase Pressure Open Circuit Alar
12/11/2003 02:40:15	Engine Saver Enabled OFF
12/11/2003 02:40:15	*** Engine Saver Reset ***
12/11/2003 02:40:22	Engine Saver Enabled ON
12/11/2003 02:40:35	** Oil Pressure Alarm
12/17/2003 08:21:17	Engine Saver Enabled OFF
12/17/2003 08:21:17	*** Engine Saver Reset ***
12/17/2003 08:21:20	Data Logging Enabled OFF
12/17/2003 08:21:29	Data Logging Enabled ON
12/17/2003 08:21:37	Engine Saver Enabled ON
12/17/2003 08:29:41	Engine Saver Enabled OFF

Logger Data						
Date / Time	RPM	Temperature	Oil Pressure	Crankcase	TURBO	Coolant
12/09/2003 13:56:36	1399.3	170.7	69.6	0	15.9	28.5
12/09/2003 13:57:36	1399.3	170.7	69.6	0	15.9	28.5
12/09/2003 13:58:36	1399.3	170.8	69.6	0	15.9	28.5
12/09/2003 13:59:36	1398.5	170.7	69.6	0	15.9	28.5
12/09/2003 14:00:36	1399.3	170.7	69.6	0	15.9	28.5
12/09/2003 14:01:36	1401.6	170.7	69.6	0	15.9	28.5
12/09/2003 14:02:36	1400.1	170.6	69.6	0	15.9	28.5
12/09/2003 14:03:36	1400.1	170.7	69.6	0	15.9	28.5
12/09/2003 14:04:36	1399.3	170.8	69.6	0	15.9	28.5
12/09/2003 14:05:36	1399.3	170.8	69.6	0	15.9	28.5
12/09/2003 14:06:36	1399.3	170.8	69.6	0	15.9	28.5
12/09/2003 14:07:36	1400.1	170.7	69.6	0	15.9	28.5
12/09/2003 14:08:36	1399.3	170.7	69.6	0	15.9	28.5
12/09/2003 14:09:36	1399.3	170.9	69.6	0	15.9	28.5
12/09/2003 14:10:36	1399.3	170.7	69.6	0	15.9	28.5

### Logger Alarms:

To review the Logger Alarms (top text grid), simply drag or click the vertical scroll bar. The date and time of the alarm is displayed in the first column. The second column of the grid displays a brief message concerning the alarm. As well as logging alarm messages the logger notes the date and time the Engine Saver was enabled and went into disabled mode.

The enabled message is the time the Engine Saver was enabled. This is determined by the equipment meeting a specific RPM or RPM and Turbo reading. This is entirely dependent on the Engine Saver configuration installed and could be different on each engine.

The disabled message is the time the Engine Saver detected a specific trip point was met and the trip point reading was met for a specific time period. This is set within the Engine Saver itself.

### Logger Data:

The Logger Data values (bottom text grid) can also be reviewed by using the vertical scroll bar to navigate through the data retrieved from the flash ram disk. Normal operations data (no alarms) is displayed as 1 minute averages. If any engine sensors produce an alarm (Engine Saver red LED indicator) the previous 10 minutes of sensor readings are stored as 5 second data values. The logger continues to store 5 second readings until the Engine Saver is reset. Once the Engine

Saver is reset, 1 minute data averages are logged again until the Engine Saver would detect another alarm criteria setting was met.

If the Logger Alarm display grid contains an alarm that you would like to review the text data values for that time period, simply double click in the left hand gray margin of the Logger Alarm grid where the black arrow is located. The black arrow pointer in the Logger Data grid (bottom grid) will be positioned to approximately 10 minutes before the alarm time. The Logger Data arrow points to a time frame for you to review events that were logged before the alarm state and the Engine Saver went into alarm mode.

Be sure to double click the left mouse button to select the alarm. A single click will not select the alarm and the Logger Data grid pointer will not move through the data to the desired location of the alarm data.

Then simply use the Logger Data grid vertical scroll bar to review the data points.

The columns of data displayed in the Logger Data grid depends upon the Engine Saver model and the specific temperature and pressure sensors installed in your field equipment.

#### Time Periods:

The standard version of Service Advantage collects normal operating data as one minute averages on even minutes.

When the Engine Saver detects an alarm criteria has been met, the previous 10 minutes of 5 second data is logged to the flash ram and data is continuously logged at 5 second intervals until the Engine Saver is reset. This provides a history of events that lead to the alarm condition. Custom data logging scenarios are available upon request.

#### Data values:

Data values for sensors installed ....

Should be within the range of the monitoring sensor installed

Zero values could indicate the sensor was not functioning properly

Blank values indicate there was no retrieval data on the flash ram disk

Data values for sensors not installed

Are displayed as zero, indicating no sensor reading taken.

## View Chart Data

To view data graphically in chart format, you must first have selected to Retrieve Logger Data.

After the data has been successfully read from the flash ram disk, select View from the main menu and click Logger Files.

You must select a time period from the Logger Alarms text grid display to produce a chart. This selects the time period that will be displayed in the first graphical chart window.

Chart time periods are not selected in the Logger Data (bottom) grid.

Only by double clicking on an alarm line can you select a date and time range to display a chart of your data.

This feature is designed to help you quickly locate the data values on the chart that relate to the alarm time period.

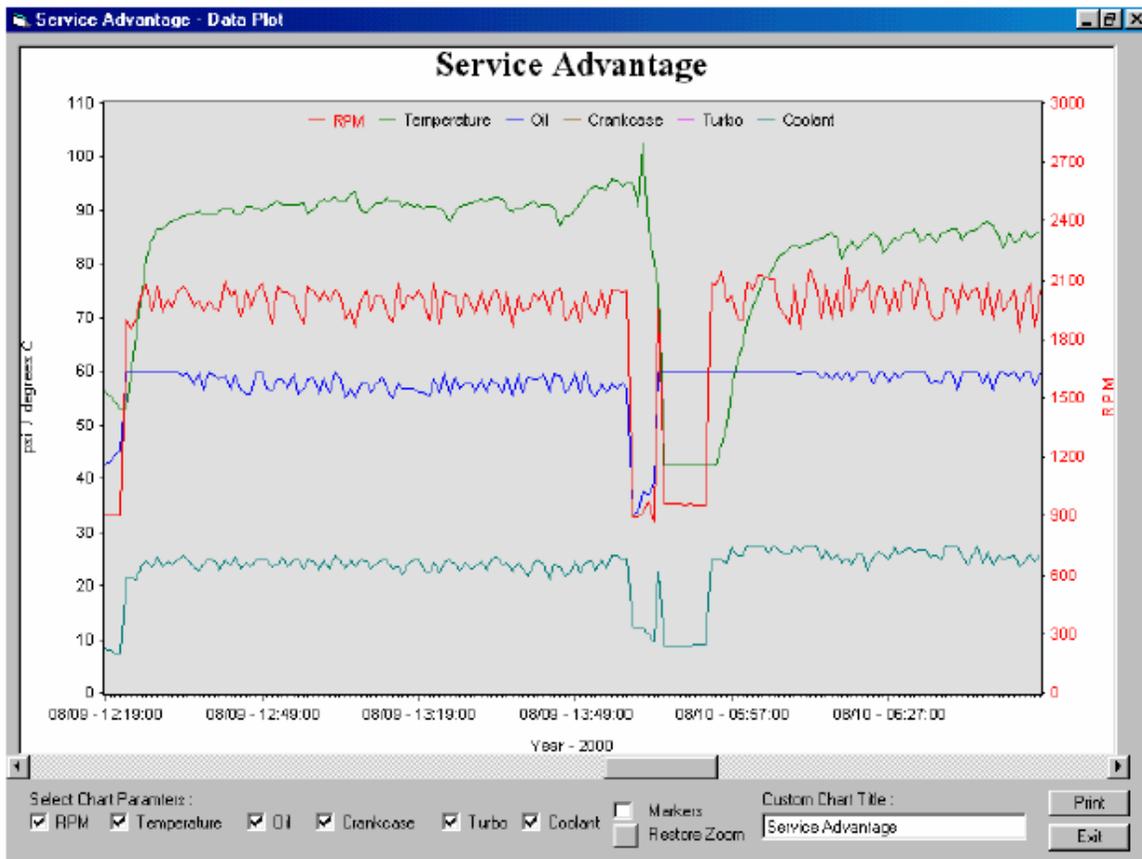
You may also just double click the first line of the Logger Alarms grid to place the chart display at the beginning of the data points retrieved from the flash ram disk.

Then simply click the Chart Over Time button to display your chart.

If you select the Chart Over Time button without previously selecting a time period, an information message will be displayed. Acknowledge the message by clicking OK. Then, double click a line in the Logger Alarms grid and select Chart Over Time.



The chart window will be displayed similar to the picture below. All sensors monitored are presented as a default on your first chart. The left Y scale will display a range for all pressure and degrees C sensor readings. The right Y scale will display the range for RPM readings. Either of the two Y scales will be displayed on if the corresponding sensor is check for display on the chart.



Navigate the chart:

Using the horizontal scroll bar:

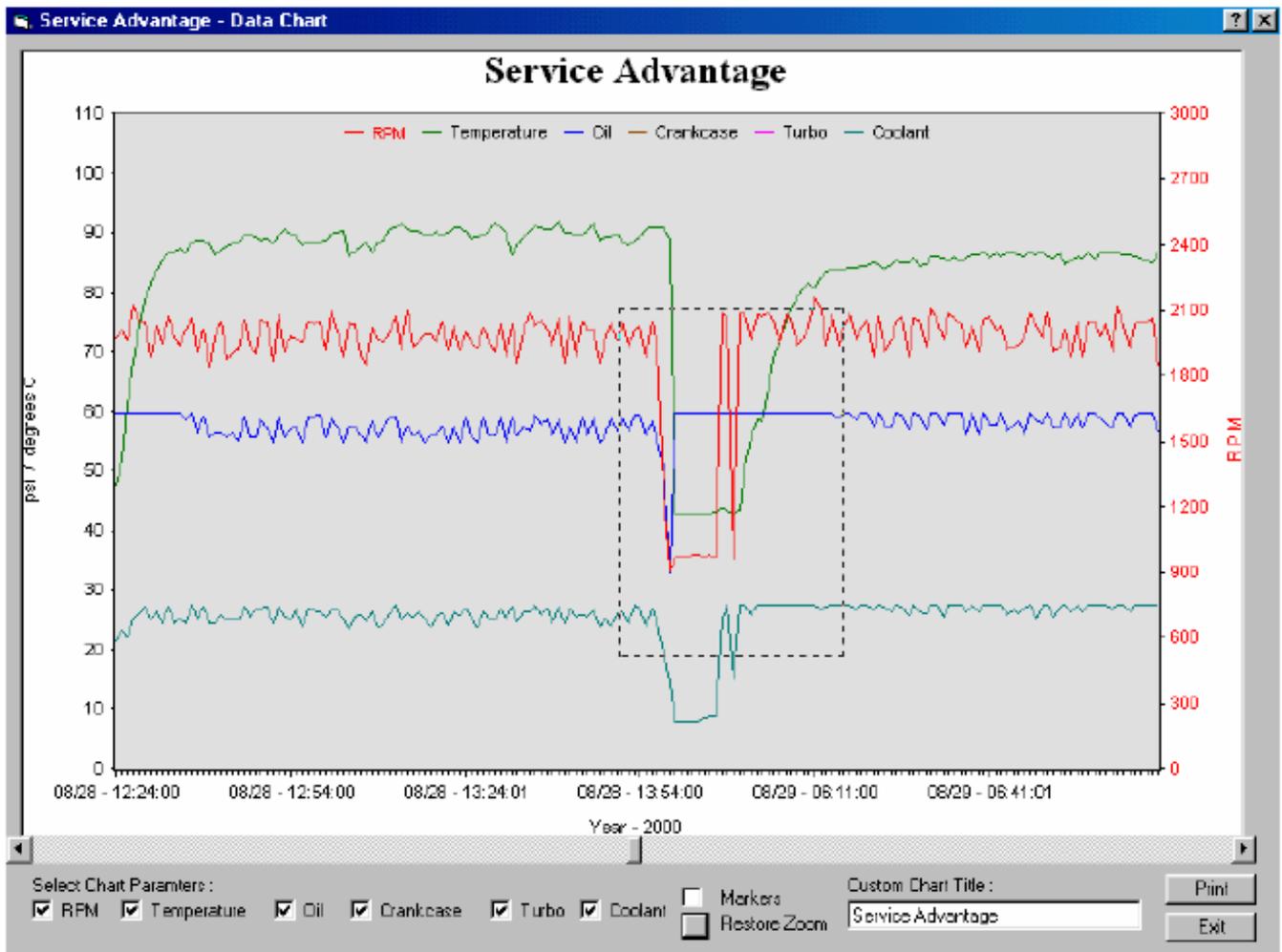
Click the arrows on the left and right of the scroll bar to increment the chart in either direction by 1 data point

Click on the scroll bar to increment the chart in either direction by 180 data points

Press and hold the left mouse button on the scroll bar button and drag the button in either direction to scroll randomly

Zooming in on data:

Locate an area of interest on the chart. Position your mouse pointer to the left of the area of interest. Press and hold the left mouse button dragging the mouse first to the right and then downward to encompass the zoom area in a dash lined box. Then release the left mouse button.



The chart will expand your selection, changing both Y axis scales. The chart will zoom up to 9 times.



At any time you may return to the original scale by clicking the Restore Zoom button located at the bottom of the screen display.

#### Customize your Chart:

##### Included Sensors:

The default setup for the first chart displayed includes all sensors. You may check or uncheck any of the engine sensor check boxes, a check indicating that the sensor is to be included in the chart display.

After changing the sensor check boxes, use one of the chart navigating methods to re-display the chart with the sensors selected. The hourglass cursor will appear until the data is reloaded with the appropriate sensor values and the new chart is displayed.

##### Title:

The default chart title is Service Advantage. Type your own company name, engine number or personalized text in the edit box and use one of the chart navigating methods to re-display the chart with your new chart title.

##### Markers:

Click the Markers check box to display different markers for each sensor on the chart. This option has been provided to differentiate each sensor line to accommodate gray scale printing.

##### Printing your Chart:

To make a printed copy of the chart displayed on the screen, simply click the Print button.

Be sure to review the chart title, markers check box and sensors shown on the display before selecting to print your chart.

Select the Markers check box to display different markers for each sensor on the chart if you are using gray scales to print your chart.

## Print your Chart

To make a printed copy of a chart display you must ....

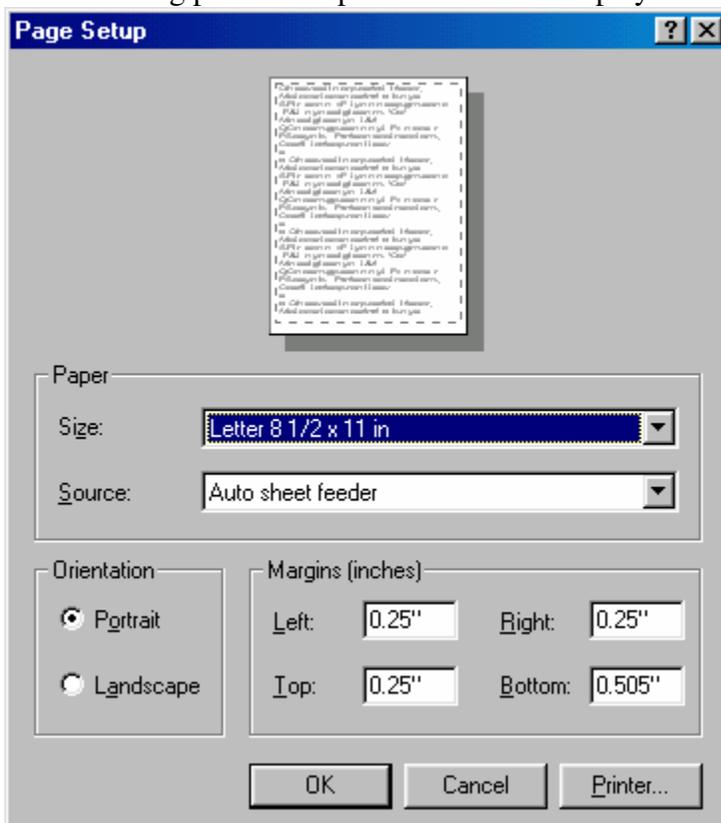
Retrieve data from the flash ram disk,  
View the text data screen,  
Select a date and time line from the Logger Alarm grid,  
Click the Chart Over Time button,  
Click the Print button,  
Select paper size, orientation, and margins  
Select a printer,  
Configure printer properties such as dpi and color or gray scale,  
And click OK to print.

Be sure to review the chart title, markers check box and sensors shown on the display before selecting to print your chart.

If you decide you do not want to print or would like to change the look of the chart, simply click Cancel until you are back to the chart window.

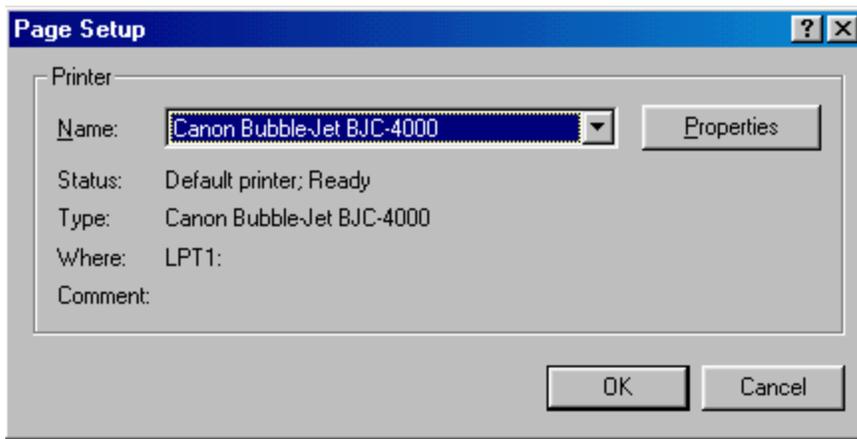
Make the desired changes and repeat the process above to click the Print button.

The following printer setup screens will be displayed immediately after clicking the Print button.

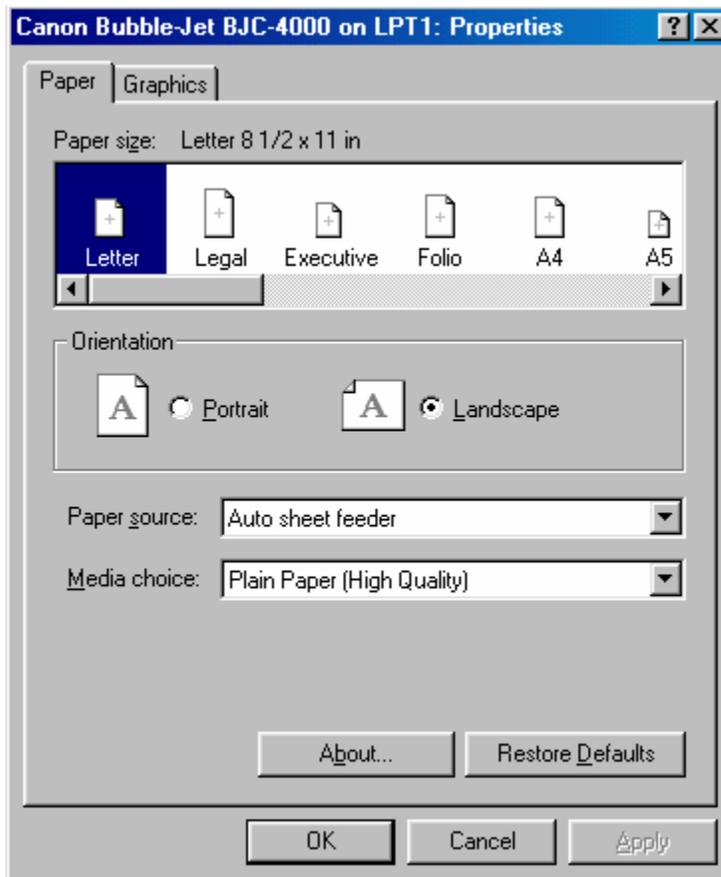


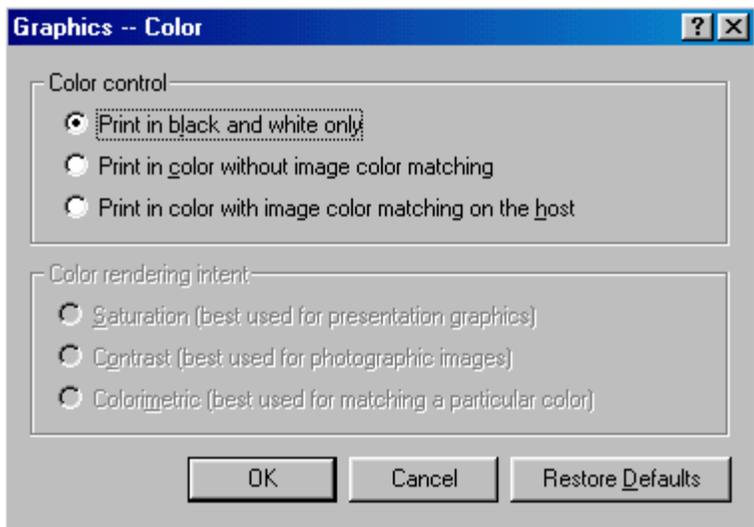
Select your desired paper size, chart orientation and margins. Using the default margins will produce a chart the size of the paper selection. If you desire a smaller screen, change the margins.

Select Printer to select a printer from a list of printers accessible from your computer.

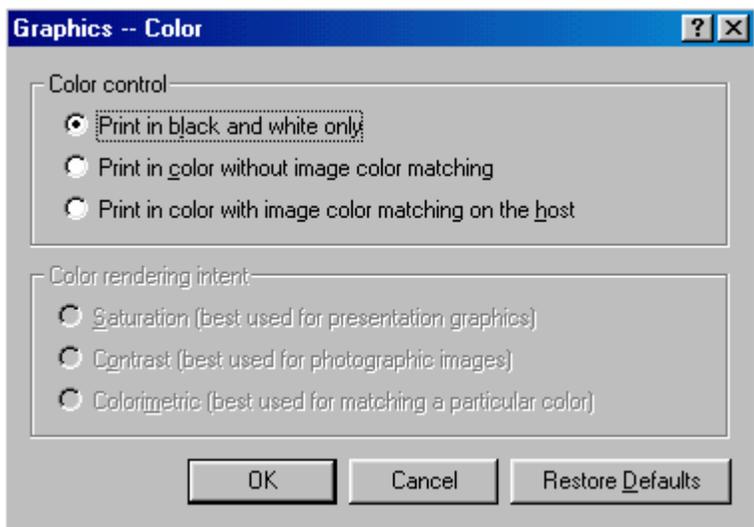


After selecting your printer, click Properties to configure the printer resolution and your choice of color or gray scale printing.

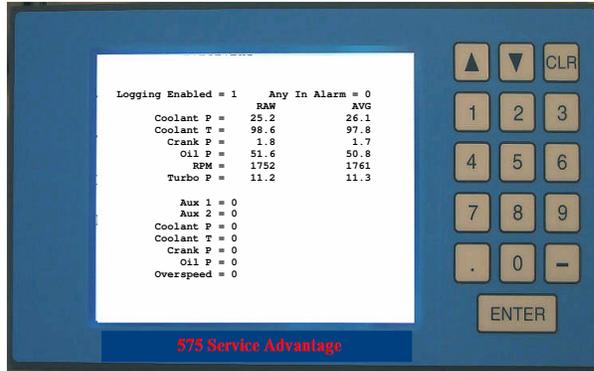




Each printer manufacturer has unique printer setup screens. The above three printer setup screens are for a Canon BJC-4000. Your specific printer setup screens will most likely be different.



# Calibrating the Service Advantage



*Calibrating the 575 Service Advantage is a simple task once the concepts and necessary steps are fully understood.*

## How Does the Engine Saver and Service Advantage Work?

The Engine Saver converts signals from the sensors into 0 to 5 volt analog signals. These analog signals are sent to the Service Advantage via the “Accessory Cable”, where they are converted into real-world values, which are then displayed on LCD panels, HMI touch screens, and/or stored on internal Compact Flash memory cartridges.

Unfortunately there are a number of things which effect how efficiently the 0 to 5 volt signals travel between the Engine Saver and the Service Advantage, most notably the length and placement of the “Accessory” cable. If this cable is too long, overall accuracy will decrease.

Before the Engine Savers analog signals can be accurately converted into real world numbers, the Service Advantage must be “Calibrated”.

## What is Calibration?

Calibration is broken into two terms “Span” and “Offset”. Each sensor has it’s own Span and Offset values which may be adjusted to ensure correct values are displayed and recorded. Once the Engine Saver and Service Advantage are installed, experience has shown these values often require adjustment to produce exacting results.

## What is an “Offset”?

Under normal operating conditions, most sensors have an Offset of 0. In other words, when the engine is shut down, the Engine Saver will produce a 0 volt signal for Oil Pressure, Coolant Pressure, Turbo Pressure, and RPM. Calibration features within the Service Advantage convert these 0 volt signals into real-world values, which represent each sensor’s Offset.

It is often necessary to adjust the Offset to accommodate long cabling or noisy environments as noted above.

Coolant Temperature Offset does not follow the above logic, and will be discussed in a part of this document devoted entirely to Coolant Temperature.

**OFFSET ERRORS MUST BE CORRECTED BEFORE ADJUSTING SPAN ERRORS**

## What is a “Span”?

The term “Span” is best defined as the equivalent real-world range between when the Engine Saver is producing a minimum 0 volt output and the maximum 5 volt output.

For example, the “Span” of the Engine Savers RPM sensor is typically 0 to 3150 RPM. At 0 RPM, the Engine Saver is outputting 0 volts and at 3150 RPM the Engine Saver is outputting 5 volts.

The Engine Saver and Service Advantage are calibrated on the bench before being shipped to the customer.

## How do you recognize Calibration errors?

Recognizing Calibration errors is a simple two-step process.

1) **Locate and correct Offset errors** when the engine is shut down and all the pressures and RPM are 0, and the Engine Saver is producing 0 volts, each of the Service Advantage values should be 0. If a value is still present when the engine is not running, enter a negative value into the Offset using the Calibration Error procedure below.

Ex. Coolant Pressure = 1.4 so the Coolant Pressure Offset = -1.4

2) **Locate and correct Span errors** when the engine is running and producing reasonable values on the gauges, the values indicated by the Service Advantage should be similar to those on the gauges.

Span Errors are evident when you notice that the values produced by the Service Advantage differ from the gauges you’re trying to mimic. For example, if the engines tachometer indicates the engine is turning at 1500 RPM and the Service Advantage displays 1400 RPM, you most likely have a Span error.

## How to calculate Span Correction

**NOTE: This is for Oil, Coolant, Crankcase, and Turbo only. Any other calibration will be discussed later.**

In the following example, we will calibrate the Coolant sensor by following this simple process:

A pressure gauge or another trusted source is connected to the engine and reports the Coolant Pressure is 29 PSI.

The Service Advantage indicates the Coolant Pressure is 22 PSI.

The Currently Installed Span is 30 PSI.

Take the readings from the Service Advantage and the Pressure Gauge. Determine which is the higher value; in this case it would be the Pressure Gauge. Proceed by subtracting the lowest value from the highest. Now take the result and add it to the span because the Pressure Gauge (or Reliable Source) is higher. If the Service Advantage had given the higher reading, then the result would have been subtracted from the span. When written it will look like this:

$$29 - 22 = 7$$

$$30 + 7 = 37 \text{ (New Span)}$$

The general formula looks like this:

Higher Value – Lower Value = Span Correction (Between the Service Advantage reading and the Reliable Source)

Span + Span Correction = New Span (If the Reliable Source is greater than the Service Advantage)

Span – Span Correction = New Span (If the Reliable Source is less than the Service Advantage)

**Note:** For Oil, use this procedure for boards made before 05/01/04. The default Span is 80 PSI and the Offset is 0. The Span will be calibrated to the trip point at 2200 RPM (42 PSI) and the Offset will be calibrated to the trip point at 900 RPM (12 PSI) due to the non-linear operation of the Oil Pressure Sensor.

Enter the new span by following the Calibration procedure below.

### *How to Calibrate RPM*

NOTE: If using magnetic pick up, ensure that the number of the teeth on the flywheel correspond to the setting on the Engine Saver model 550 (See page 13 of the Model 550 manual.)

The key to the calibration of the RPM is a simple calculation as seen in this example:

RPM on the Service Advantage at running equals 1724 RPM and 524 RPM at Idle.

Your reliable source is reading 1645 RPM at running speed and 501 at Idle.

The first step is to adjust the run RPM reading, which is a little different from the idle adjustment. Take the Lowest value and subtract it from the Highest, then multiply or divide that answer by 1.3 as in this example:

$(\text{Higher} - \text{Lower}) \times 1.3 = \text{Run Correction}$  if the Reliable Source is higher.

Since the Service Advantage is higher, you will be Subtracting the Run Correction from the SPAN value. In the case of the Reliable Source being higher you would add the Run Correction to the SPAN value.

The second step is to take care of the low end, or the idle RPM reading. Take the Higher of the two readings and subtract the Lower from it, in this case:

$\text{Higher} - \text{Lower} = \text{Idle Correction}$

Since the Service Advantage is higher, you will be subtracting the Idle Correction from the OFFSET value. In the case of the Reliable Source being higher you would add the Idle Correction to the OFFSET value.

Note: This process may need to be performed several times to get the correct value.

## How to Calibrate Coolant Temperature

The key to the calibration of the Coolant Temperature is a simple calculation as seen in this example:

Coolant Temperature on the Service Advantage at running equals 94.6°C.

Your reliable source is reading 100°C.

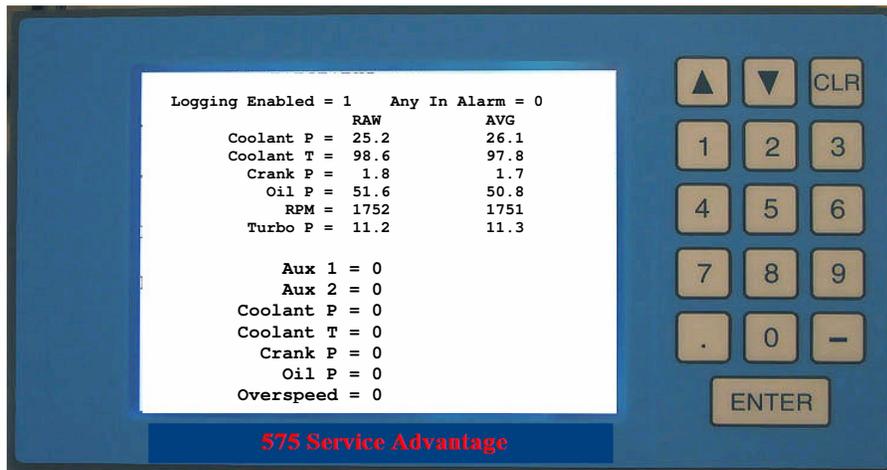
$$(\text{Higher} - \text{Lower}) \times 2 = \text{Span Correction}$$

Since the Service Advantage is lower, you will be Adding the Span Correction to the SPAN value. In the case of the Reliable Source being lower you would subtract the Span Correction from the SPAN value.

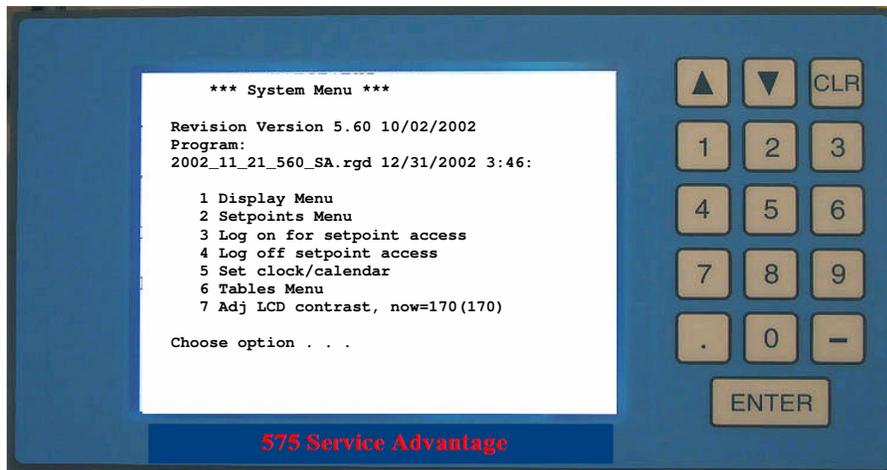
Note: The Span is the only calibration necessary for the Coolant Temperature.

## How to correct Calibration Errors

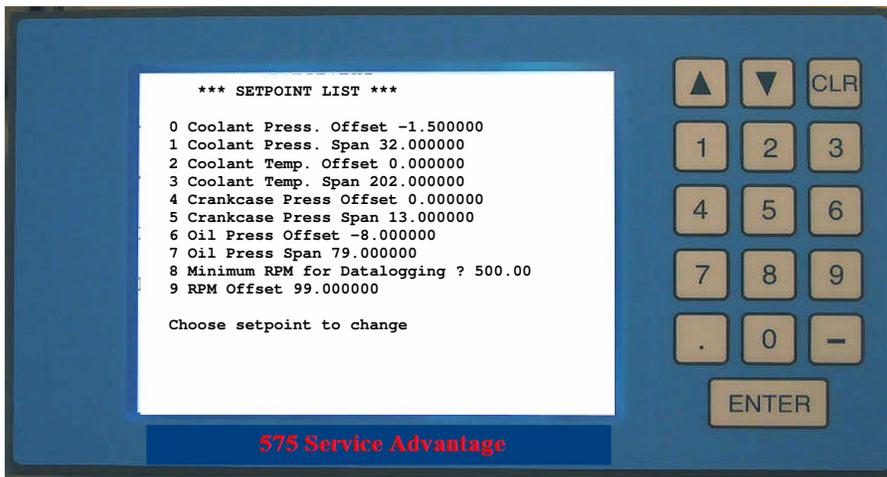
Once an error has been recognized, plug the 575 Service Advantage LCD display into the appropriate port on the Service Advantage and the following screen will appear (The Maple display cannot yet be used for this function):



Press the  button to exit this menu. You will then be at the System Menu, which should appear like this:



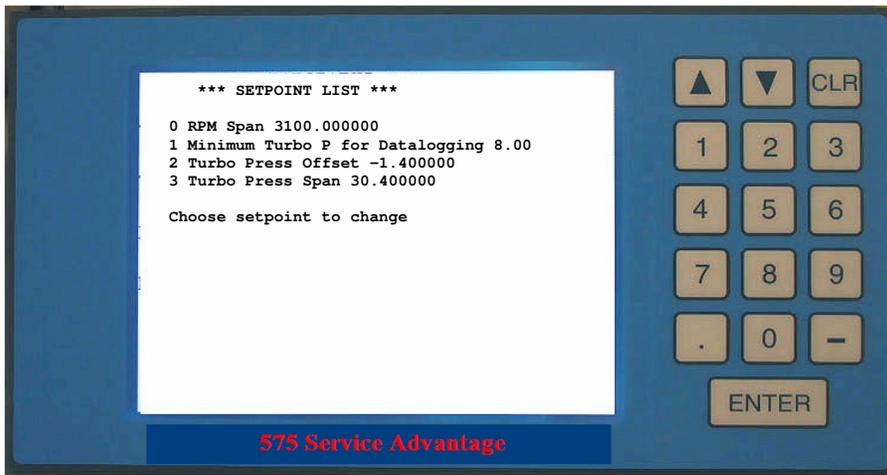
Then Press the “2” button to enter the Setpoint List menu which will look like this:



Changing the value for a certain Span or Offset is very simple. Just Press the number that corresponds with the value you need to change:

Ex. Press 6 to change the Oil Pressure Offset

Type in the new value, then hit . If the value that you need to change is not present in the list, press  to see the next set of values. The second list will look like this:



Once all of the values are correct just press the  button to exit to the System Menu. To enter the monitoring screen again just press the 1 key then the 0 key.

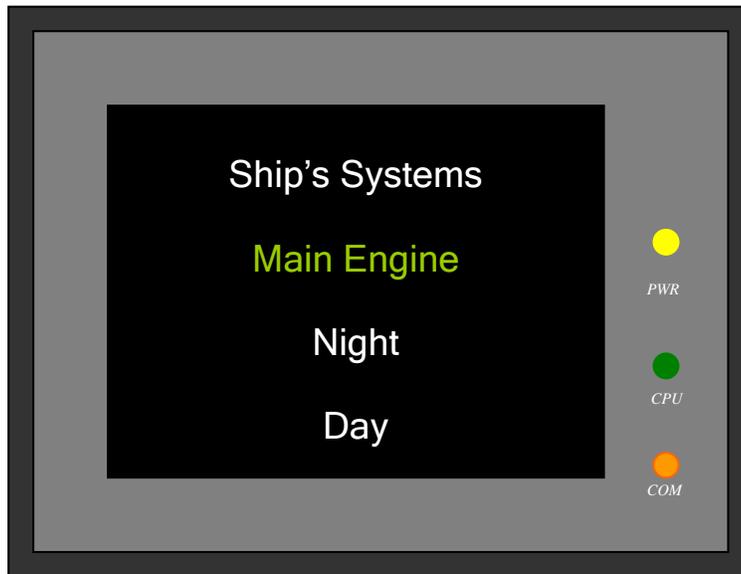
NOTE: If you choose the wrong value when trying to change another, just hit the  button to go back a step without changing anything.

### To read Voltages instead of values on the LCD Display:

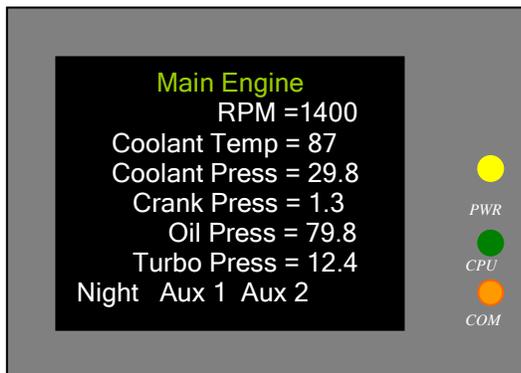
Set all Offset values to 0 and all Span values to 5. This will show the analog voltages entering the Service Advantage instead of the sensor values. These values are used to calculate the proper Span and Offset values or to test the cable going to the Service Advantage.

## How to use the Service Advantage Display

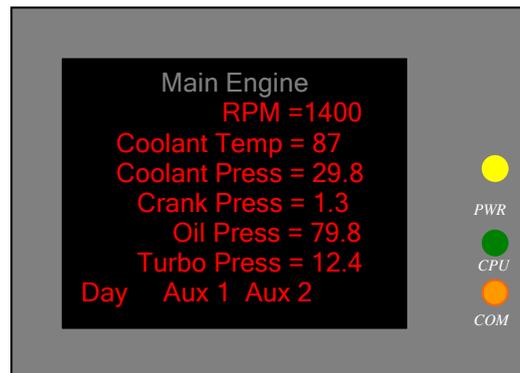
The use of the Service Advantage Display is very simple. The first display you will see is the Main Menu, which consists of two main buttons “Day” and “Night”. (The words “Day” and “Night” are the buttons.)



The “Day” option will take you to a bright screen and the “Night” option will take you to a dimmed screen. The two screens look like this:



DAY



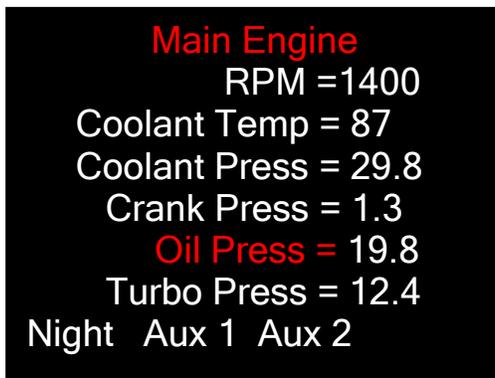
NIGHT

The words “Main Engine” is also a button that takes you back to the main screen, also the Day and Night buttons at the bottom of the screens will toggle between the two screens.

When an error occurs a screen appears over the day and night screens like this:



Just touch this screen to remove it, but the words Main Engine will turn red as well as the measurement in alarm.



Note: If the Main Screen is showing, the only indication of an alarm will be the words Main Engine turning red. To see the alarm, just hit the Day or Night button.

The Main Menu and the Day “Main Engine” indicator will be white if the engine is not running, green if the engine is running and there are no errors, and red if there is an error. The Night displays “Main Engine” indicator will be red if the engine is not running, gray if the engine is running with no errors, and white if there is an error. These colors can be customized upon request, such as red for port and green for starboard.

### Brightness

The brightness can be adjusted by the adjustment near the lower right hand corner on the 5.7" (57-A575-520) and right above the PLC [RS-232] port on the back of the 7.7" (57-A575-530).

## Troubleshooting

### Service Advantage Model 575

No Function	Possibly power is not connected. Check that the Accessory (57-A550-39) harness is connected at both ends. Check for blown fuse on the Auxiliary board in the Engine Saver, FU3.
No enable, readings are all zero, but unit is powered.	Engine Saver off. Accessory cable loose. Engine not running.
Readings not accurate.	Recalibrate Service Advantage.
Can't read from Compact Flash Card.	Double click on the "My Computer" icon. Right click on the "Removable Disk" drive. Click on Properties. Click on the "Tools" tab, and then under Error-checking click on the Check Now button (This will bring up the Check Disk Program). Put a check in the "Automatically fix file system errors" box then click on the "Start" button. When finished, close the windows you opened.
Compact Flash card does not contain any files.	Check Date and Time - if set to 00/00/2000 00:00:00 (Which happens when the watch style battery loses its charge) Press the "5" button from the Main Menu and follow the instructions. Possible Compact Flash Board defective.

### Standard LCD Display

Readings are faint.	Press  . Press the "7" button. Enter the number "170", which is the default display setting. Press  .
No or Intermittent display.	Check ribbon cable connection. Possibly defective.
Display flashes.	Disconnect, and then reconnect ribbon cable. If this has no effect, reset power by disconnecting and then reconnecting the Accessory harness.
Display refreshes quickly, then resets to the System Menu.	Send the Service Advantage back for reprogramming.

### Service Advantage Display

No display.	Check that the cable is connected to the Service Advantage; the terminal strip is wired properly, Red is going to +24V and Black is going to 0V.
"Updating" appears occasionally.	This is normal due to functions being performed by the Service Advantage.
"Updating" appears continuous.	Check the 9-pin connector going to the back of the display for a loose connection. Check the Red plug on the right most card inside the Service Advantage for a loose connection.
All readings are zero.	Engine Saver is off. Service Advantage failure.

## Span values

Note that these values are based on a perfect environment. They are used as a starting point for programming the Service Advantage.

### Coolant Temperature

5.0V = 178.6° C

0.0V = 0° C

5.0V = 384.6° F

0.0V = 32° F

### RPM

5.0V = 3125 RPM

### Crank Pressure

5V = 15 inH2O

### Turbo Pressure

5.0V = 30 PSI

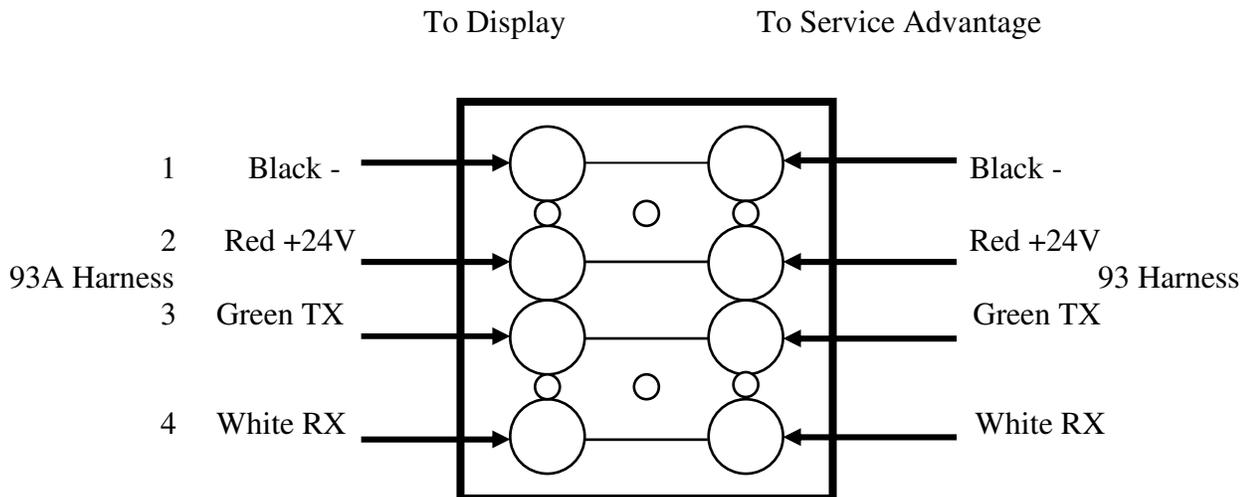
### Coolant Pressure

5.0V = 30 PSI

### Oil Pressure

5.0V = 72.5 PSI

## Wiring for the Terminal Strip



## *Emailing the Flash Card Data*

The computer looks upon the Compact Flash Card reader as another drive. And the information on this drive is just as easy to access.

1. Insert the Compact Flash Card in to the reader.
2. Start by opening Outlook or Outlook Express (Which ever is your current email software.)
3. Start a new email:
  - A. Outlook: Click on the “New” button in the second row of buttons on the top of the screen.
  - B. Outlook Express: Click on the “Create Mail” button in the second row of buttons on the top of the screen.
4. Enter the email address of the person your sending this to in the “To” box.
5. Enter the subject of the email.
6. Enter any text you wish to send along with these files in the message box.
7. Click on the “Insert” option at the top of the new email window. Then click on the option “File” (Outlook) or “File Attachment” (Outlook Express).
8. Go to the “Look In” pull down box and find the  Removable Disk (E:) drive. This may not be the (E:) drive on your system, but this is very common.
9. Highlight both the ALARM and DATA files by clicking once on the fist then, while hold the Shift key, click on the second file.
10. Click on the “Insert” button (Outlook) or the “Attach” button (Outlook Express). This will attach the files to the email.
11. Click on the “Send” button to send the email to the recipient.

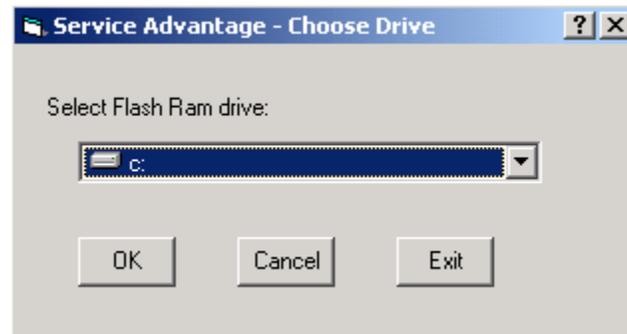
When the email is received:

1. Open your email program.
2. Click on the email.
3. Click on the paper clip at the top right of the email window.
4. Save the files to the  Local Disk (C:) as follows:
  - A. For Outlook:
    - I. Click on the first file and a window will pop up giving you the option to save this file or open it.
    - II. Choose “Save File to Disk” and click OK.
    - III. Click on the “Save In” pull down box and then click on the  Local Disk (C:) to save it to the root directory of your main drive.
    - IV. Do the same with the next file.
  - B. For Outlook Express:
    - I. Under the two files is the option “Save Attachments...” Click on this to save the files.
    - II. Click on the Browse button and choose  Local Disk (C:) and then click OK.
    - III. Click the Save button

Note: Outlook Express will not allow you to save these files unless you change the setting in Tools, Options, Security tab, and then uncheck the box marked “Do not allow attachments to be saved or opened that could potentially be a virus.”

Using the data saved:

Once the data is saved to the  Local Disk (C:), open the Service Advantage software as you would if you were reading this information from the card itself, except when this window comes up:



Just click OK; you do not have to change the drive letter. Then use the software as you would normally.

If you have any questions please call 1 (717) 932-9900, and ask for Steven Wida.

# Service Advantage Quick Sheet

## Span

For Coolant, Crankcase, Turbo, and Oil\* values:

Higher Value – Lower Value = Span Correction (Between the Service Advantage reading and the Reliable Source)

## For RPM:

(Higher Value – Lower Value) x 1.3 = Run Correction

## For Coolant Temperature:

(Higher Value – Lower Value) x 2 = Span Correction

Span + Span Correction = New Span (If the Reliable Source is greater than the Service Advantage)

Span – Span Correction = New Span (If the Reliable Source is less than the Service Advantage)

## Offset

For Coolant, Crankcase, Turbo, and Oil\* values:

Higher Value – Lower Value = Offset Correction (Between the Service Advantage reading and the Reliable Source)

## For RPM:

Higher Value – Lower Value = Idle Correction

Coolant Temperature has no offset correction.

Offset + Offset Correction = New Offset (If the Reliable Source is greater than the Service Advantage)

Offset – Offset Correction = New Offset (If the Reliable Source is less than the Service Advantage)

\*For Oil use the standard procedure. The Span will be set to a default Span of 80 PSI and an Offset of 0. The Span will be calibrated to the trip point at 2200 RPM (42 PSI) and the Offset will be calibrated to the trip point at 900 RPM (12 PSI) due to the non-linear operation of the Oil Pressure Sensor.

## Calibrating the Service Advantage

Press the “-“ button. You will then be at the System Menu.

Press the “2” button to enter the Setpoint List Menu.

Press the number that corresponds with the value you need to change.

Type in the new value, then hit “ENTER”. If the value that you need to change is not present in the list, press “ENTER” to see the next set of values.

Once all of the values are correct press the “-“ button to exit to the System Menu. To enter the monitoring screen again press the “1” key then the “0” key.

## Span Values

Note that these values are based on a perfect environment. They are used as a starting point for programming the Service Advantage.

### Coolant Temperature

5.0V = 178.6° C

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### RPM

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### Turbo Pressure

5.0V = 30 PSI

### Coolant Pressure

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### Oil Pressure

5.0V = 72.5 PSI

## To read Voltages instead of values on the LCD Display:

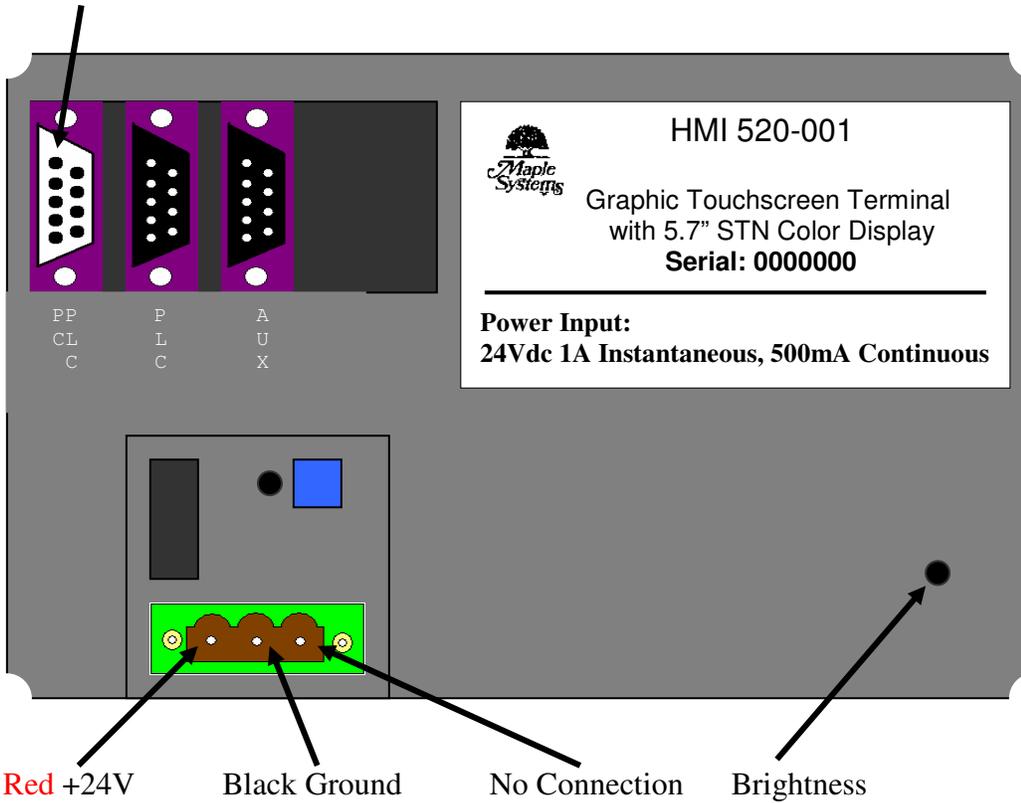
Set all Offset values to 0 and all Span values to 5. This will show the analog voltages entering the Service Advantage instead of the sensor values.

## Formatting a Compact Flash Card:

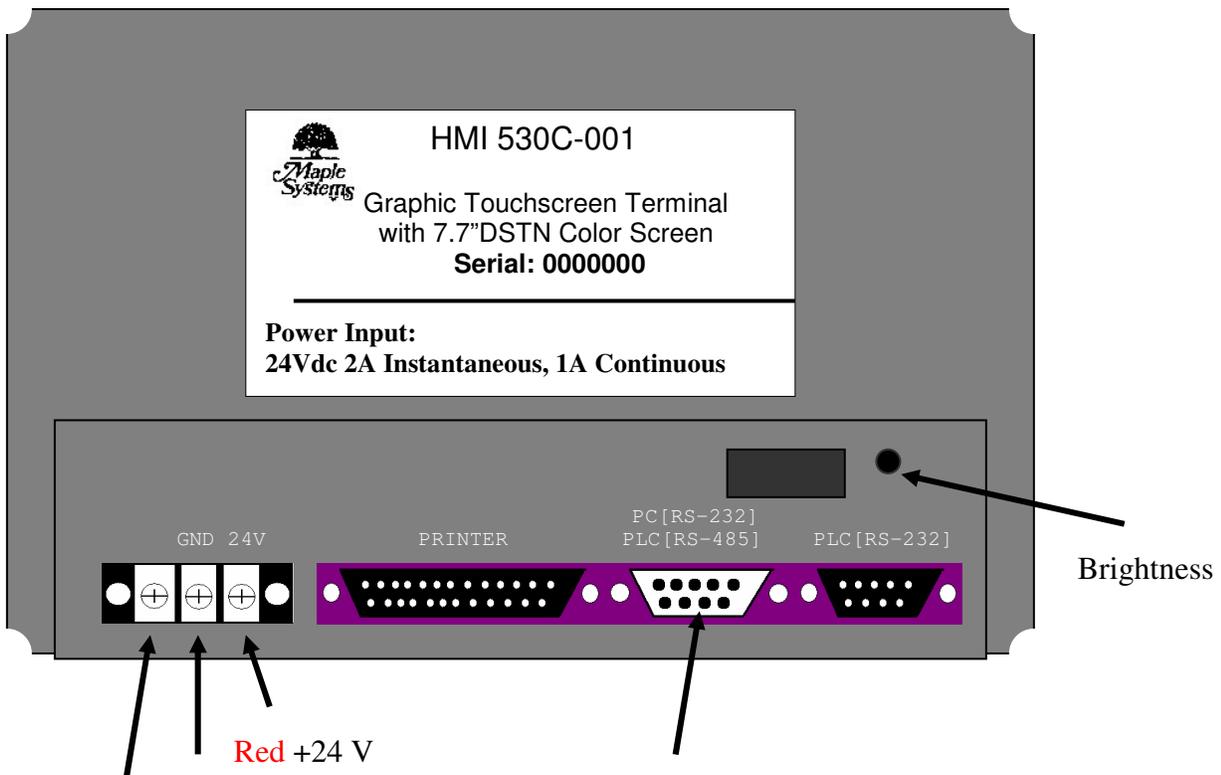
1. Insert the Compact Flash card into the card reader
2. Start the Windows Explorer
3. Right click on the  Removable Disk (E:) and click on Format
4. Set the File System to FAT
5. Click the Start button
6. When the popup window appears, click OK
7. Click the Close button

## Wiring for the Service Advantage Displays

9 Pin data connector



Red +24V      Black Ground      No Connection      Brightness



Red +24 V

Black Ground  
No Connection

9 Pin data connector

### Replacement Parts

Description	Part Number
Relay Board	57-5750-01
CPU Board	57-5750-04
Compact Flash Card	57-5750-07
Compact Flash Board	57-5750-08
Analog Input Board	57-5750-09
Digital Input Board	57-5750-10
Combo Board	57-5750-11
Isolated Digital Input Board	57-5750-12
Standard LCD Display	57-A575-01
Service Advantage Display Board	57-A575-05
Service Advantage Display Cable	57-A575-93
5.7" Service Advantage Display	57-A575-520
7.7" Service Advantage Display	57-A575-530
5 Pin Header Connector	CN 640440-5
4 Pin MS Connector	CN 3102A12SL844P
Analog/Digital Board Connector	CN 924-0435
17 Pin MS Connector	MS CN 3102 A20-29P
Fuse Holder	FU 96F7723
Fuse	FU 216-2A