SOLARFLOW PLUS AND MODEL 2251 GC CONTROLLER

DANIEL MEASUREMENT AND CONTROL
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DANIEL INDUSTRIES, INC.
SOLARFLOW PLUS AND MODEL 2251
GAS CHROMATOGRAPH CONTROLLER
DATA ACQUISITION SYSTEM SOFTWARE MANUAL
IBM PC TO SOLARFLOW PLUS
(SFDAS, REVISION W AND LATER)

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SECTION 1

INTRODUCTION

1.0 INTRODUCTION

The SolarFlow Plus design provides several methods for gaining access to data generated by SolarFlow Plus. This manual describes the SolarFlow Plus/Model 2251 Gas Chromatograph Controller (2251 G.C.C.) Data Acquisition System (SFDAS) software package, which provides the following capabilities for gaining access to SolarFlow Plus and Model 2251 Gas Chromatograph Controller data:

1. Retrieval of Data Logs generated by SolarFlow Plus

2. Retrieval of Event Logs generated by SolarFlow Plus

3. Database capability for storage, display, and printing of data and event logs retrieved from SolarFlow Plus

4. Retrieval of 24-hour averages and active alarms from the Model 2251 Gas Chromatograph Controller

5. Database capability for storage, display, and printing of 24-hour average data and alarms retrieved from the Model 2251 Gas Chromatograph Controller

6. Direct channel access to SolarFlow Plus to change or fix channel variables; acknowledge or change alarms; or view the Channel Zero Report.

The SFDAS program can be configured to retrieve data from up to a total of 100 SolarFlow Plus computers and/or Model 2251 G.C.C. units. The SFDAS program may be set to dial each SolarFlow Plus computer at a predetermined time using a Hayes (or compatible) modem capable of up to 2400-baud communications.

SFDAS program provides three ways of communicating with SolarFlow Plus instruments:

- updating specified logs
- retrieving all data/event logs
- retrieving logs for specified days

The SFDAS program requires that the location of a SolarFlow Plus computer unit and the method for contacting the unit be defined in order to communicate with SolarFlow Plus computers. The SFDAS program disk includes a menu that allows the user to enter the phone number of the selected location and other parameters. The SFDAS system supports the Hayes Smartmodem protocol. If a Hayes modem is connected to the PC, the SFDAS can place telephone calls to the selected location automatically at the time (or times) specified.

The SFDAS package is provided on one 3.5" floppy diskette. The software package is designed to run on version 2.1 MS-DOS or later. Backup of the Daniel-supplied diskette is essential. (Consult the DOS operating manual for diskette backup instructions.) The original SFDAS diskettes should be stored in a safe location. The files included on the diskette and those built during use of the program are defined in section 7 of this manual.

SECTION 2

INSTALLATION

2.0 GENERAL

Your software is delivered on a 3.5" diskette archived in a compressed format which cannot be directly executed until properly installed. After installation, place the distribution diskette in safe storage for backup. The following instructions enable you to install the software on a hard drive or on another diskette.

a. Insert the distribution diskette in drive A: and type:

A: <—┘ <ENTER>

INSTALL <—┘ <ENTER>

b. Follow the instructions on your screen.

NOTE: If your floppy drives are designated differently, replace A: with the drive name that matches the 3.5" diskette provided.

---

c. The INSTALL program will transfer the files to a sub-directory called SFDAS (unless you change the default directory name). To run the program after a PC shutdown, type:

C>CD\SFDAS <—┘ <ENTER>

C>SFDAS <—┘ <ENTER>

2.1 SFDAS SYSTEM SETUP

After completing the installation, the SFDAS program will load and the screen will display the following format:

```
            SolarFlow Plus/2251 G.C.C. Data Acquisition System
                              Revision __

            Copyright (c) 1987, 1988 by Daniel Industries Inc.
                          All Rights Reserved
```

NOTE: For help at any time while using this system, press the H key while holding down the ALT key.

Press the S key while holding down the ALT key. The following display appears on the computer monitor:

```
System Setup
═══════════════════════════════════════════════════════════════════════

Screen Codes ... Normal              02        00             EXAMPLE
                 Underscore          01        00             EXAMPLE
                 Reverse Video       07        00             EXAMPLE
                 Highlight           10        00             EXAMPLE
                 Blink               18        00             EXAMPLE
                 Field Pointer       01        00             EXAMPLE

Real-Time Clock                      NO
                                    Port    Addr      IRQ  RTS DELAY #1/#2-msec
Port Parameters ... Direct Connect  COM1    3F8        4          0
                    Modem Dial-Up   COM1    3F8        4          0
                    Modem Init.     X4V1Q0E0S0=0S7=255
    Dictionary Drive Name        Default
Data Drive Names ... Main        Default
                     Aux. #1     Default
                     Aux. #2     Default
                  Main Label

Printed Data Log Format         STANDARD
═══════════════════════════════════════════════════════════════════════

                     F1: Change   F2: Abort   F3: Finished
```

Each element of the preceding screen is described as follows. (Help is available on any element of the screen by pressing the ALT/H key combination.)

2.1.1 Screen Codes

Screen Codes provide for selecting the color format on computers with color displays. The left column of numbers are color codes for text display. The right column of numbers are color codes for background display. (Note: To make changes in this screen, follow the guidelines provided in section 2.2, "Accessing System Setup Parameters.")

The following table shows the colors available in the system and the numerical value assigned to the color. When an asterisk (*) appears in the color section of the following table, the color blinks on the screen when it is selected.

Value	Color	Value	Color	Value	Color
0	Black	12	Medium red	24	Dark gray*
1	Dark blue	13	Light violet	25	Medium blue
2	Green	14	Yellow	26	Light green*
3	Light blue	15	White	27	Light blue*
4	Dark red	16	Black*	28	Medium red*
5	Dark violet	17	Dark blue*	29	Light violet*
6	Amber	18	Green*	30	Yellow*
7	White	19	Light blue*	31	White*
8	Dark gray	20	Dark red*		
9	Med. blue	21	Dark violet*		
10	Light green	22	Amber*		
11	Light blue	23	Off white*		

Background (right column of color codes) provides for selecting the color of the background display that lies behind foreground text. The colors available are 0 through 15 in the preceding table.

Normal provides for selecting the color in which text normally appears on the screen. The colors available are 1 through 31 in the preceding table.

Underscore provides for selecting the color in which underscored text appears on the screen. The colors available are 1 through 31 in the preceding table.

Reverse Video provides for selecting the color in which reverse video text appears on the screen. The colors available are 1 through 7 in the preceding table.

Highlight provides for selecting the color in which highlighted text appears on the screen. The colors available are 1 through 31 in the preceding table.

Blink provides for selecting a color for text that blinks when it appears on the screen. The blinking colors are 17 through 31 in the preceding table.

Field Pointer provides for selecting a color for pointing out text on the screen. The colors available are 1 through 31 in the preceding table.

2.1.2 Real Time Clock

Real Time Clock enables the selection of a real-time clock for SFDAS if the computer has that capability. The selections available are YES and NO. Press the HOME key to toggle selection.

2.1.3 Port Numbers

Port Numbers enables communication port assignments for the direct connect and/or modem dial-up system between the PC and the SolarFlow Plus computer. The selections available are COM1, COM2, COM3, and COM4 with default PC port addresses and IRQ, or custom configurations.

2.1.4 Data Drive Names

Data Drive Names selects the computer drive on which data files are stored when the files are retrieved from SolarFlow Plus. The selections available are A, B, C, D, and Default.

2.1.5 Main Label

Main Label allows installation of a main menu label. The label may have a length of 45 characters or less.

2.1.6 RTS Delay (Msec)

RTS Delay requires an input in Milliseconds to allow your communication system to get up to speed so initial data is not lost. The minimum delay here will enable the most efficient transfer of data.

2.1.7 Printed Data Log Format

A choice of similar but slightly different Report Formats is available. The "STANDARD" format is that normally printed by SFDAS. The "HHDT" format is that normally printed by the Hand Held Data Terminal (HHDT).

2.1.8 Modem Init.

Modem Initialization String. Default string can be changed to match modem setup configuration. Some modems might require data compression and correction to be disabled for proper operation at low speeds.

2.2 ACCESSING SYSTEM SETUP PARAMETERS

The SFDAS system setup parameters may be changed by the following procedure:

a. Press the F1 function key and move the cursor to the parameter to be changed using the UP and DOWN arrow keys. Press the HOME key.

b. Type in the parameter change on the keyboard; then press the carriage return key.

c. Move the cursor to the next parameter to be changed using the UP and DOWN arrow keys. Press the HOME key and make the change.

d. When all changes have been made, press the END key. The three function key options are redisplayed at the bottom of the screen.

e. Press the F3 function key to save the parameter changes. The starting screen is displayed on the monitor again.

f. Press the SPACE bar to continue the program. The following screen appears on the monitor.

```
SolarFlow Plus / 2251 G.C.C. Data Acquisition System

                    Main Menu Options

          F1: SF+ Data Log/G.C.C. Data Access
          F2: Event Log Access
          F3: Change Acquisition Directory
          F4: Automatic Data Collection
          F5: Direct Channel Access Mode
         ESC: Exit
                      Your Choice?
```

Five options available to the operator include:

- SolarFlow Plus Data Log/G.C.C. Data Access
- Event Log Access
- Change Acquisition Directory
- Automatic Data Collection
- Direct Channel Access Mode

Note that the Change Acquisition Directory function (F3) must normally be completed before using the other functions. These options are discussed in the following sections.

SECTION 3

ACQUISITION DIRECTORY SETUP

3.0 CHANGING THE ACQUISITION DIRECTORY

3.1 GENERAL

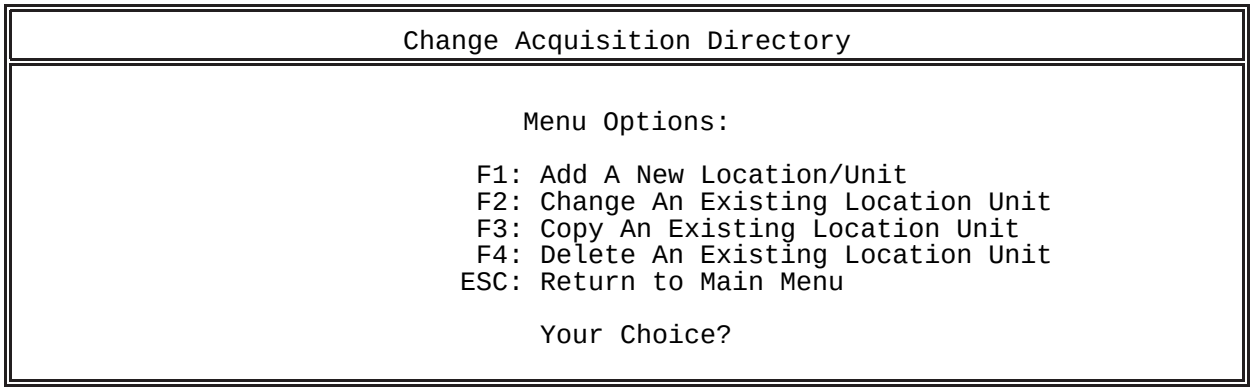
The SFDAS program requires that the contact method and location be defined in order to communicate with SolarFlow Plus computers and Model 2251 Gas Chromatograph Controllers (2251 G.C.C.). Information needed by the SFDAS program to establish communications with an instrument must be entered into the Acquisition Directory before communications can begin.

The Acquisition Directory provides for the following:

- adding communications locations
- changing the parameters of existing locations
- copying an existing location to a new location
- deleting an existing location

3.2 THE CHANGE ACQUISITION DIRECTORY

The Acquisition Directory is accessed from the Main Menu Options screen by pressing the F3 function key on the PC keyboard. The following display appears on the monitor.



3.2.1 Adding a New Location/Unit

Option F1 on the Change Acquisition Directory screen provides for adding a new location/unit to the SolarFlow Plus data acquisition system. A new location/unit is added using the following procedure:

a. Press the F1 function key. The SFDAS program requests entry of an abbreviated four-character alphanumeric name for the new location/unit using the following format:

Add a New Location

Abbreviated name of new Location _ _ _ _

b. Enter the name on the computer keyboard and press the carriage return key.

c. The SFDAS program displays the prompt "LOCATION TYPE (S=SF+ C=2251)". Type in **S** for a SolarFlow Plus location or **C** for a 2251 location and press the carriage return. The program returns to the previous menu screen.

3.2.2 Changing an Existing Location/Unit for SolarFlow Plus Units

The procedure for changing location data depends on whether the location type is a SolarFlow Plus unit or a Model 2251 G.C.C. Option F2 on the Change Acquisition Directory Menu provides for changing location data acquisition parameters that are normally stored on a data disk in drive B. Possible changes might include changing the telephone number of the location, modifying the security code, and changing the ID of the location. The following procedure applies to SolarFlow Plus units:

a. Press the F2 function key. The following screen appears on the monitor.

```
                    Change an Existing Location

                          Select Loc/Unit:

                  F1: Location/Unit  Name # 1
                  F2: Location/Unit  Name # 2
                  F3: Location/Unit  Name # 3
                  F4: Location/Unit  Name # 4
        PG-UP / PG-DN: Previous/Next 10 Units
            ESC/ALT-X: Return to Previous/Main Menu
                          Your Choice?
```

b. Press the function key that corresponds to the Location/Unit to be changed. (The screen displays a maximum of ten Locations at one time. Pressing the **Pg Up** and **Pg Dn** keys on the PC keyboard displays the previous or next ten locations respectively.) The following screen appears when the desired function key is pressed.

```
                    Change an Existing Location
                     Location:  "Name"

                Menu Options
          F1:  Change Location Name, ID, Phone Number,...
          F2:  Security Code
          F3:  Change Unit Name, Number, ID, PC/Unit Baud rate
          F4:  Change Log Mode, Clear Mode, Date Last Log
          F5:  Change Miscellaneous Log Data List
          F6:  Change Channel Log Data List
    ESC/ALT-X:  Return to Previous/Main Menu
                Your Choice?
```

c. Pressing the F1 function key allows the user to modify the following parameters:

```
      Change Location Name,  ID,  Phone Number,..  Location:"Name"

       Abbreviated Name:  "Four (4) A/N characters"
          Complete Name:  "Max. of 15 A/N characters"
             ID  Number:  "Max. of 10 A/N characters"(1)

       Telephone Number:  "Max. of 40 characters"(2)

        Dictionary Name:  "Select name-HOME key"

      F1:  Change  F2:  Abort  F3: Finished
```

NOTE:

1. In addition to digits 0 through 9, the telephone number may contain the following special characters:

   P sets the pulse dialing mode
   T sets the tone dial mode (default)
   , sets approximately two second delay
   - is used to improve readability

   Alternately a single X may be used to signify a direct connection to the location. A "Dxx", where xx is a 2-digit number, may be inserted before or after the phone number to extend the modem timeout to the indicated number of seconds. Add an "M" immediately after the phone number to communicate through a Multi-drop modem. Add an "R" for radio packetized logon. The BACKSPACE key may be used to correct mistakes.

2. Specific dictionaries are supported for the Model 2480. Refer to the file list in section 7.1 for the available file names.

The F1, F2, and F3 function keys in the previous screen initiate, abort, or finish any changes made. The "ALT H" key combination provides help if needed.

d. When all changes are completed, press the F3 function key. The Menu Options screen for the location selected appears again.

3.2.3 Changing the Security Code for SolarFlow Plus Units

The security code for a SolarFlow Plus location data acquisition system is changed using the F2 function key. The security code is changed using the following procedure:

a. Press the F2 function key. The following display appears.

```
 Change Security Code                                        Location:"Name"

                  Security Code
                      01        120


          F1:  Change   F2:  Abort   F3:  Finished
```

b. Press the appropriate function key. The security code is a two to ten-digit numeric and/or alphabetic code that must end with a zero, one, or two. Optionally, this security code may be followed by a comma and an "auxiliary" code up to ten characters in length. This auxiliary code may be used to activate alternate communication capabilities in certain SolarFlow Plus applications. To enter changes, press HOME. Enter any changes and press END. (The ALT-H keys provide HELP on security code limits.) When changes are completed press the F3 key. The Menu Options screen for the selected Location appears.

3.2.4 Changing Unit Name, ID Number, and Baud Rate for a SolarFlow Plus Unit

The unit name, ID, number, and baud rate for a SolarFlow Plus unit are changed using the F3 function key at the Menu Option screen. The baud rate defines the communications rate to be used with this location. The options available for the baud rate are 300, 600, 1200, and 2400. Changes are made using the following procedure:

a. Press the F3 key. The following screen appears.

```
Change Unit Name, ID, Number, PC/Unit Baudrate          Location:"Name"

                Name:  "Max. 15 A/N characters"
                  ID:  "Max. 10 A/N characters"
              Number:  "One digit(0)"
           Baud Rate:  300/600/1200/2400


            F1:  Change   F2:  Abort   F3: Finished
```

NOTE: In most SolarFlow Plus installations, baud rates of 300 and 1200 are available. Other baud rates may be available depending on the communications interfaces installed.

---

b. As indicated at the bottom of the screen, the F1 key initiates a change and the F2 key aborts a change. (The ALT and H key combination provides HELP for changing this screen.)

c. When changes are completed, press the F4 key. The Menu Options screen for the selected Location appears.

3.2.5 Changing Log Mode, Clear Mode, and Date Last Log for a SolarFlow Plus Unit

The Acquisition mode data for a SolarFlow Plus unit is modified using the F4 function key. The modifications are made with the following procedure:

a. Press the F4 key. The following screen appears.

```
   Change Acquisition Mode, Clear Flag, Last Update          Location:"Name"

          Acquisition Mode:
                Clear Flag:  0
          Date Last Update:

             F1: Change   F2: Abort  F3: Finished
```

b. Press the appropriate function key. (The ALT and H key combination provides HELP on making these changes.)

NOTE: The "Date Last Update" shows 12 digit positions. Ignore the last two or the seconds positions if not needed.

---

c. When changes are completed, press the F3 key. The Menu Options screen for the selected Location appears.

Acquisition Mode, Clear Flag and Last Update are defined as follows.

3.2.5.1 Acquisition Mode

The Acquisition Mode defines how logs are to be updated. The following table defines the modes available.

MODE	DEFINITION
0	Acquire all data since last update
1-35	The number of days for which data is to be acquired
36 or greater	Acquire ALL data stored in the SolarFlow Plus computer

3.2.5.2 Clear Flag

The Clear Flag defines how the logs are to be stored. The table below defines the flags available.

FLAG	DEFINITION
0	Append the acquired data to the existing log file.
1	Erase the old file and replace it with the newly acquired data.

3.2.5.3 Date Last Update

Date Last Update provides the date and time of the last update. The date/time group is presented in the format: YYMMDDHHMMSS, where:

YY	is the last two digits of the year, e.g., 87 = 1987.
MM	is the numerical equivalent of the month, e.g., 05 = May; 11 = November.
DD	is the day of the month, e.g. 01 is the first; 30 is the 30th.
HH	is the hour of the day in 24-hour format, e.g., 18 is 6pm.
MM	is the minute of the hour, e.g., 08 is 8 minutes past the hour.
SS	is the seconds of the minute, normally set to 00

The Date Last Update is updated by overwriting the field with a new date/time group. It is used by all uploads of SolarFlow Plus logs in the Autocollect mode. In the Manual mode, it is used by all uploads except the Event log upload.

3.2.6 Changing the Miscellaneous Log Data for a SolarFlow Plus Unit

The Miscellaneous Log Data List is a list of channels for which information will be acquired when the Miscellaneous Data Log is uploaded at the beginning of each month. To make modifications, press F5 to obtain the following screen.

```
 Change User Miscellaneous Log Data List                    Location:"Name"

          Channel Type        Channel     Type        Channel     Type
    01      19    0      15                      29
    02      20    1      16                      30
    03      26    2      17                      31
    04      45    0      18                      32
    05      100   0      19                      33
    06      101   0      20                      34
    07                   21                      35
    08                   22                      36
    09                   23                      37
    10                   24                      38
    11                   25                      39
    12                   26                      40
    13                   27
    14                   28

                  F1:  Change   F2:  Abort   F3: Finished
```

a. The entries list is composed of: Channel and Type (which consists of value "0", low scale "1", or high scale "2"). For some channels, only value type is permitted. The ALT-H keys provide help on changing the parameters.

b. To change a parameter, press F1 and a cursor appears which can be moved via the cursor (arrow) keys. Move to the desired channel and press ENTER. Press the HOME key and enter the new value. Pressing return accepts the change; ESC aborts the change. Pressing the INS key allows a new item to be inserted in the middle of the list. Pressing the DEL key allows an item to be removed. When changes are complete, press the END key to exit the edit mode.

c. Press F2 (Abort) or F3 (Finished) to return to the previous menu.

3.2.7 Changing the Channel Log Data List for a SolarFlow Plus Unit

The Channel Log Data List is a list of channels for which information will be acquired when the Channel Data Log is uploaded. The Channel Log is uploaded via the autocollect POLL/COLLECT commands, or via the UPLOAD LOG selection in the SF+ DATA LOG/GCC ACCESS menu. To make modifications, press F6 for the following screen.

```
Change User Channel Log Data List                          Location:"Name"

     Channel     Type          Channel     Type          Channel     Type
     01    19    0     15                      29
     02    20    1     16                      30
     03    26    2     17                      31
     04    45    0     18                      32
     05    100   0     19                      33
     06    101   0     20                      34
     07                21                      35
     08                22                      36
     09                23                      37
     10                24                      38
     11                25                      39
     12                26                      40
     13                27
     14                28

     F1:  Change     F2:  Abort    F3: Finished
```

a. The entries list is composed of: Channel and Type (which consists of value "0", low scale "1", or high scale "2". For some channels, only value type is permitted. The ALT-H keys provide help on changing the parameters.

b. To change a parameter, press F1 and a cursor appears which can be moved via the cursor (arrow) keys. Move to the desired channel and press ENTER. Press the HOME key and enter the new value. Pressing return accepts the change; ESC aborts the change. Pressing the INS key allows a new item to be inserted in the middle of the list. Pressing the DEL key allows an item to be removed. When changes are complete, press the END key to exit the edit mode.

c. Press F2 (Abort) or F3 (Finished) to return to the previous menu.

3.2.8 Changing the Location/Unit for a Model 2251 G.C.C.

Location data is changed for a Model 2251 G.C.C. using the following procedure. Option F2 on the Change Acquisition Directory Menu provides for changing location data acquisition parameters that are normally stored on a data disk in drive B (or C in a hard drive). Possible changes might include changing the telephone number of the location, modifying the security code, and changing the ID of the location.

a. Press the F2 function key. The following screen appears on the monitor.

```
                    Change an Existing Location

                            Select Loc/Unit:

                        F1: Location/Unit Name # 1
                        F2: Location/Unit Name # 2
                        F3: Location/Unit Name # 3
                        F4: Location/Unit Name # 4
              PG-UP / PG-DN: Previous/Next 10 Units
                  ESC/ALT-X: Return to Previous/Main Menu
                             Your Choice?
```

b. Press the function key that corresponds to the Location/Unit to be changed. The screen displays a maximum of ten Locations at one time. Pressing the **Pg Up** and **Pg Dn** keys on the PC keyboard displays the previous or next ten locations respectively. The following screen appears when the desired function key is pressed.

```
Change an Existing Location                              Location:"Name"

                            Menu Options

                F1: Change CG ID, Comm ID, Phone Number,...
                F2: Change Communications Baud rate, Clear mode
           ESC/ALT-X: Return to Previous/Main Menu

                     Your Choice?
```

c. Pressing the F1 function key allows the user to modify the following parameters:

```
  Change GC ID,  COMM ID,  Phone Number,...                Location:"Name"

            Abbreviated Name:  "Four (4) A/N characters"
                       GC ID:  "Max. of 15 A/N characters"
                    Comm ID:  "Max. of 3 digits"[1]
            Telephone Number:  "Max. of 40 characters"[2]


            F1:  Change   F2:  Abort  F3:  Finished
```

NOTE:

1. Must not be more than 247.

2. Add an "M" immediately after the phone number to communicate through a Multi-drop modem. See Notes in c. of section 3.2.2.

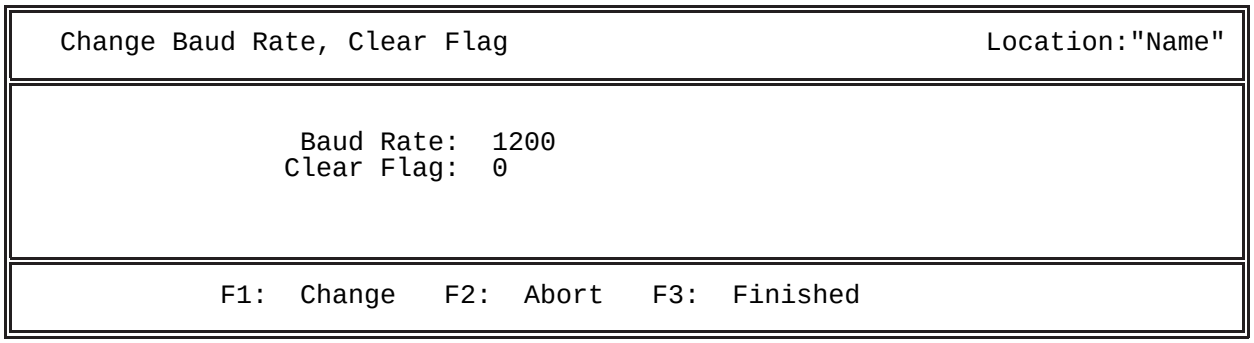
The F1, F2, and F3 function keys are used to initiate, abort, or finish any changes made. The "ALT H" key combination offers additional information on changing these parameters.

d. When all changes are completed, press the F3 function key. The Menu Options screen for the location selected appears again.

3.2.9 Changing Baud Rate and Clear Flag for a Model 2251 G.C.C. Unit

The baud rate and clear flag for a Model 2251 G.C.C. is modified using the F2 function key. The Baud Rate and Clear Flag functions are defined in sections 3.2.8.1 and 3.2.8.2. The modifications are made with the following procedure:

a. Press the F2 key. The following screen appears.



b. As indicated at the bottom of the screen illustrated above, the F1 key initiates a change and the F2 key aborts a change. Press the appropriate key. The ALT and H key combination provides HELP on changing these parameters.

c. When changes are completed, press the F3 key. The Menu Options screen for the selected Location appears.

3.2.9.1 Baud Rate

The baud rate defines the communications rate to be used with this location. The options that appear in the screen are 300, 600, 1200, and 2400. In most SolarFlow Plus installations, only baud rates of 300 and 1200 are available. Other baud rates may be possible depending on the communications interfaces available.

3.2.9.2 Clear Flag

The Clear Flag defines how the collected data are stored. The following table defines the flags available.

FLAG	DEFINITION
0	Append the acquired data to the existing log file.
1	Erase the old file and replace it with the newly acquired data.

3.2.10 Copying an Existing Location/Unit

An existing location/unit is copied to a new location using the F3 function key at the Change Acquisition Directory main menu screen. The procedure provided for copying an existing location/unit is the same for both SolarFlow Plus units and the Model 2251 G.C.C. The procedure follows:

a. Press F3. The following screen appears.

```
                    Copy an Existing Location

                            Select Option:

                F1: Select Source Location and Copy

                F2: Select Source Drive (Now B: Drive)

                F3: Select Destination Drive (Now B: Drive)

            ESC/ALT-X: Return to Previous/Main Menu

                       Your Choice?
```

In the screen just shown, pressing F2 repeatedly steps the display through the source drives available. Only those drives defined under system setup (ALT S) appear on the screen. Pressing F3 steps the display through the destination screens defined under system setup (ALT S).

b. Press F1 to display the following screen.

```
                    Copy an Existing Location

                            Select Source:

                    F1: Location/Unit  Name # 1

                    F2: Location/Unit  Name # 2

                    F3: Location/Unit  Name # 3

                    F4: Location/Unit  Name # 4

          PG-UP / PG-DN: Previous/Next 10 Units

              ESC/ALT-X: Return to Previous/Main Menu

                            Your Choice?
```

c. Select the location/unit to be copied by pressing the appropriate function key shown on the screen. The screen displays a maximum of ten Locations at one time. Pressing the **Pg Up** and **Pg Dn** keys on the PC keyboard displays the previous or next ten locations respectively. When a location is selected, the following screen appears, which requests a four digit alphanumerical abbreviated name of the new Location.

```
  Copy An Existing Location

     Abbreviated Name of New Location? _ _ _ _
```

d. Enter abbreviated name and press Enter. The program copies the associated files. When the operation is complete, the following screen appears.

```
Copy An Existing Location

     Abbreviated Name of New Location? [xxxx]

     Copying Location Files...

     Copy Completed Successfully.

     Press SPACE to Continue...
```

3.2.11 Deleting an Existing Location/Unit

The data acquisition system parameters of a location/unit are deleted using the F4 function key from the Change Acquisition Directory main menu screen. The procedure for deleting an existing location/unit is the same for both SolarFlow Plus and the Model 2251 G.C.C. Proceed as follows.

a. Press F4. The following screen appears.

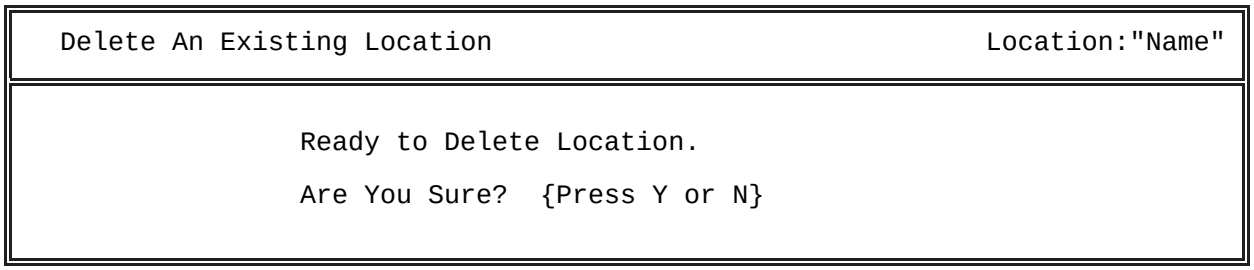
```
                    Delete an Existing Location

                          Select Loc/Unit:

                  F1: Location/Unit  Name # 1
                  F2: Location/Unit  Name # 2
                  F3: Location/Unit  Name # 3
                  F4: Location/Unit  Name # 4
          PG-UP / PG-DN: Previous/Next 10 Units

              ESC/ALT-X: Return to Previous/Main Menu
                             Your Choice?
```

b. Select the location/unit to be deleted by pressing the appropriate function key shown on the screen. The screen displays a maximum of ten Locations at one time. Pressing the **Pg Up** and **Pg Dn** keys on the PC keyboard displays the previous or next ten locations respectively. When a location is selected, the following screen appears.



c. Press the **N** key to abort the delete operation. Press the **Y** key to delete the location data. If **Y** is pressed, the operation is completed by the program.

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SECTION 4

DATA LOG ACCESS

4.0 ACCESSING DATA LOGS

4.1 DATA LOG STORAGE AND COMPUTATIONS

Data access for both SolarFlow Plus and the Model 2251 Gas Chromatograph Controller is from the Main menu of the SFDAS program. The procedure for data retrieval is similar for both instruments.

An on-site SolarFlow Plus computer is a computer system that consists of a location computer and one or more associated unit slave computers. The slave units compute and store data log information and can make data log entries at specified time intervals. Data logs stored by a slave unit computer are accessed through the SolarFlow Plus location computer by means of the SFDAS program.

Similarly the Model 2251 G.C.C. stores 24-hour averages of up to 15 items. The 24-hour average data are also retrieved using the SFDAS program.

4.2 SOLARFLOW PLUS DATA LOG AND MODEL 2251 GAS CHROMATOGRAPH CONTROLLER DATA ACCESS PROCEDURE

The data access mode must be entered from the Main Menu. From the data access mode, the location/unit of the data log is specified in order to make a data log entry. The data access procedure depends on whether the location/unit specified is for a SolarFlow Plus unit or a Model 2251 G.C.C. The procedures for access to data for both units are given as follows:

a. Press the F1 function key from the Main Menu (shown as follows) to invoke the data log mode.

```
SolarFlow Plus / 2251 G.C.C. Data Acquisition System

                    Main Menu Options:

                F1: SF+ Data Log/G.C.C. Data Access
                F2: Event Log Access
                F3: Change Acquisition Directory
                F4: Automatic Data Collection
                F5: Direct Channel Access Mode
               ESC: Exit

                      Your Choice?
```

When the F1 key is pressed, the following screen appears.

```
                        Data Log Access

                      Select Loc/Unit:

                F1: Location/Unit  Name # 1
                F2: Location/Unit  Name # 2
                F3: Location/Unit  Name # 3
                F4: Location/Unit  Name # 4
     PG-UP / PG-DN: Previous/Next 10 Units
         ESC/ALT-X: Return to Previous/Main Menu
                      Your Choice?
```

b. Press the function key that corresponds to the Location/Unit for the data to be accessed. The screen displays a maximum of ten Locations at one time. Pressing the **Pg Up** and **Pg Dn** keys on the PC keyboard displays the previous or next ten locations respectively.

4.3 SOLARFLOW PLUS DATA LOG ACCESS

The following sections provide the data access procedure if the location/unit specified is a SolarFlow Plus location. Section 4.4 provides the data access procedure for a Model 2251/2255 G.C.C. location.

The following screen appears when the function key is pressed for a SolarFlow Plus location.

```
Location:  "Name from above"                          Unit:  "Name from above"
                          Data/Channel Log Access

                                 Menu Options:

                       F1: Upload Log
                       F2: Display Log
                       F3: Print Log
                       F4: Change Logging Time Interval
                       F5: Clear Log File
                  ESC/ALT-X: Return to Previous/Main Menu

                            Your Choice?
```

The six choices provided by the Data Log Access Menu are described as follows.

4.3.1 Uploading the Data Log

The data, miscellaneous, and channel logs are uploaded using the F1 function key. Uploading is accomplished using the following procedure.

a. Press the F1 key and the following screen appears, which requests entry of the location security code.

```
Upload/Data Log                              Location: "Name from above"
                                              Unit:     "Name from above"

          Enter Security Code:  [_ _ _ _ _ _ _ _ _ _]
```

b. Enter the location security code on the PC keyboard. After entry of the security code the message "Working" is displayed on the monitor. The selected location/unit is contacted and the monitor display indicates that the data log entries are being uploaded. When uploading is complete, information about the upload is displayed, e.g., success of upload, time on-line, number of log entries uploaded, and the last log entry uploaded. The miscellaneous data entries are uploaded if the SolarFlow Plus is cold started or if the month has changed since the last data log upload. The data uploaded during this procedure is placed on the computer drive specified for data.

c. Press the **SPACE** bar to return to the Data Access Menu screen.

4.3.2 Data, Miscellaneous, and Channel Log Displays

The procedure for displaying the data, miscellaneous, and channel logs and a discussion of the display formats follow. The data, channel and miscellaneous logs have identical formats. The data log appears on the screen first followed by the miscellaneous and channel logs.

4.3.2.1 Data Log Display Procedure (F2)

The F2 function key is used to display the data log uploaded by the procedure in section 4.3.1. The data log is displayed by the following procedure.

a. Press the F2 key. The following screen appears on the monitor.

```
Display Data/Channel Log                    Location: "Name from above"
                                            Unit:     "Name from above"

          Enter Beginning Date To Display {MM/DD/YY}: [_ _ _ _ _ _ _ _]
```

b. Enter the date of the log to be displayed in the format shown on the screen and press ENTER. A request for the beginning time appears on the monitor as shown.

```
 Display Data Log                                  Location: "Name from above"
                                                   Unit:     "Name from above"

            Enter Beginning Date To Display {MM/DD/YY}:[MM/DD/YY]
            Enter Beginning Time To Display {HH/MM}:[_ _ _ _ _]
```

c. Enter the hour and minute of the log in the format shown on the screen and press ENTER. The data log will appear in the format as shown. When finished with the data and miscellaneous (not shown) logs, press F2. The channel log (identical format to miscellaneous log) will then appear. The channel log data and the miscellaneous data entry file are displayed for the time requested in the formats shown below with only a change of title.

```
 Display Data Log                                  Location: "Name from above"

                                                   Unit:     "Name from above"

Date     Time    FLOW PRES FLOW TEMP  TOT UC VOL LOG UC VOL TOT C VOL
U-Range O-Range  LOG C VOL
Misc.

09/19/86  07:30     189.4      88.7    145.7      145.7      120.03
........  ........    5.3
........

09/19/86  08:00     189.4     188.7    145.7       56.50     119.96
........ ........    21.7
........

 End-Of-Log-File
```

F2: FINISHED

Display Channel Log Location: " Name from above"
Unit: "Name from above"

Date	Time	Channel	Name	Value	Unit	Fxd/Var
07/01/88	14:14	22 Value	METER TEMP	0	DEG F	V
07/01/88	14:14	22 Loscale	METER TEMP	0	DEG F	V
07/01/88	14:14	22 Hiscale	METER TEMP	150	DEG F	V
07/01/88	14:14	23 Value	DIFF PRES1	0.0	InH2O	V
07/01/88	14:14	23 Loscale	DIFF PRES1	0.0	InH2O	V
07/01/88	14:14	23 Hiscale	DIFF PRES1	150.0	InH2O	V
07/01/88	14:14	32 Value	ORIF DIAM2	4.000	IN	V
07/01/88	14:14	33 Value	ATMS PRES	14.73	PSIA	V
07/01/88	14:14	34 Value	PRES BASE	14.73	PSIA	V
07/01/88	14:14	35 Value	TEMP BASE	60	DEG F	V

F1: Next Screen F2: Finished

4.3.2.2 Data Log Display Format for Under-Range, Over-Range, and Miscellaneous Faults

Under-range, over-range and miscellaneous faults are displayed in the following format.

Date: The data log date group is shown under the column head **Date** in the screen above in the following format: MM/DD/YY in which MM is the numerical month (01 through 12), DD is the day of the month (01 through 31) and YY is the last two digits of the year (e.g., 90 = 1990).

Time: The data log time group is shown under the column head **Time** in the screen above in the following format: HH:MM in which HH is the hour in 24-hour format (00 through 24) and MM is the minute (00 through 59).

Under-Range: Under-range faults are displayed on the screen below the date group in the space occupied by a series of eight decimal points (dots) in the data log screen. When an under-range fault or faults exist, the dots are replaced in the display by number (s) indicating the under-range channel (s). For instance..

```
1 represents Ch. 19 --
2 represents Ch. 20   ╫
       ...            ╫ - under-range fault
8 represents Ch. 26 --
```

Over-Range: Over-range faults are displayed on the screen below the time group in the space occupied by a series of eight decimal points (dots)in the display data screen. When an over-range fault or faults exist, the dots are replaced in the display by number (s) indicating the over-range channel (s). For instance..

```
1 represents Ch. 19 --
2 represents Ch. 20   ╫
       ...            ╫ - over-range fault
8 represents Ch. 26 --
```

Miscellaneous: Miscellaneous faults or conditions are displayed on the screen in the series of eight decimal points (dots) shown beneath the eight dots used to display under-range faults (below the date group). When a miscellaneous condition or faults exist, the dots are replaced in the display by number (s) indicating the miscellaneous conditions.

The miscellaneous conditions are represented by numbers which are identified as follows:

1 is Calibration over-deviation
2 is Fpv Adj Pres out of range
3 is Fpv Adj Temp out of range
4 is reserved
5 signifies a daily log
6 is warm start
7 is cold start
8 is System fault

4.3.3 Printing the Data Log

The F3 function key is used to print the data, miscellaneous, and channel logs from the Data Log Menu screen. These data logs are printed by the following procedure.

a. Press the F3 key. The following screen appears.

```
Print/Channel Data Log                          Location: "Name from above"
                                                Unit:     "Name from above"

          Enter Beginning Date To Print {HH/MM/YY}:[_ _ _ _ _ _ _ _]
```

b. Type in the date desired in the format shown in the screen and press ENTER. The SFDAS program requests the beginning time as shown.

```
Print Data/Channel Log                          Location: "Name from above"
                                                Unit:     "Name from above"

          Enter Beginning Date To Print {MM/DD/YY}:[MM/DD/YY]

          Enter Beginning Time To Print {HH/MM}:[_ _ _ _ _]
```

c. Enter the hour and minute of the log in the format shown on the screen and press ENTER. The SFDAS program requests the ending date as shown.

```
Print Data/Channel Log                          Location: "Name from above"
                                                Unit:     "Name from above"

          Enter Beginning Date To Print {MM/DD/YY}:[MM/DD/YY]

          Enter Beginning Time To Print {MM:MM}:[HH:MM]

          Enter Ending Date To Print {MM/DD/YY}:[_ _ _ _ _ _ _ _]
```

d. Enter the ending date in the format shown on the screen and press ENTER. The SFDAS program requests the ending time as shown.

```
Print Data/Channel Log                          Location: "Name from above"
                                                Unit:     "Name from above"

          Enter Beginning Date To Print {MM/DD/YY}:[MM/DD/YY]

          Enter Beginning Time To Print {HH:MM}:[HH:MM]

          Enter Ending Date To Print {MM:DD:YY}:[MM:DD:YY]

          Enter Ending Time To Print {HH/MM}:[_ _ _ _ _]
```

The SFDAS program searches the data log file and prints the data for the time period requested. The format of the printout is the same as the format for the data log display described in section 4.2.2.

4.3.4 Changing the Data Log Time Interval

The F4 function key is used to change the data log time interval. The data log time interval is changed by the following procedure.

a. Press the F4 key. The following screen appears.

```
Location:  "Name from above"                      Unit: "Name from above"
                    Change Logging Time Interval

                           Select Interval:

                F1:  None
                F2:  5 Minute
                F3:  15 Minute
                F4:  30 Minute
                F5:  1 Hour
                F6:  4 Hour
                F7:  24 Hour
          ESC/ALT-X:  Return to Previous/Main Menu

                      Your Choice?
```

b. Select the interval for logging. The SFDAS program requests the security code as shown.

```
Change Data Logging Time Interval          Location: "Name from above"
                                           Unit:     "Name from above"

                    Enter Security Code: [_ _ _ _ _ _ _ _ _ _]
```

c. Enter the security code. If the code is valid, the program contacts selected Location/Unit and installs the newly selected data logging time interval.

4.3.5 Clearing the Data Log File

The F5 function key is used to clear the data log file. Only invoke this option if the data log file is to be deleted from the data disk. The data log file is cleared by the following procedure.

a. Press the F5 key. The following screen appears.

```
Clear Data Log File                        Location: "Name from above"
                                           Unit:     "Name from above"

                    Clear Data Log File?  {Y/N}
```

Pressing the **N** key aborts the operation. Pressing the **Y** key clears the file and provides a notice on the monitor that the Clear action has taken place.

b. Press SPACE bar to return to the Data Log Access menu.

4.4 MODEL 2251 GAS CHROMATOGRAPH CONTROLLER DATA ACCESS

The following screen appears when the function key is pressed for a Gas Chromatograph (G.C.C.) location.

```
                    GCC ID:  12345
                         GCC Data Access

                          Menu Options:

                    F1:  Upload GCC Data

                    F2:  Display GCC Data

                    F3:  Print GCC Data

                ESC/ALT-X: Return to Previous/Main Menu

                         Your Choice?
```

The three choices provided by the GCC Data Access Menu are described as follows.

4.4.1 Uploading the Model 2251 G.C.C. Data

The G.C.C. data are uploaded by pressing the F1 function key. The following screen appears.

```
                    Upload  GCC Data

                      GC ID:     12345

            Contacting Location...[74,,405-363-5574M           ]
```

Pressing the **SPACE** bar returns the Data Access Menu screen.

4.4.2 GCC Data Display

The procedure for displaying GCC data and a discussion of the display format follow.

4.4.2.1 GCC Data Display Procedure (F2)

The F2 function key is used to display GCC data uploaded by the procedure in section 4.4.1. The data are displayed by the following procedure.

a. Press the F2 key. The following screen appears on the monitor.

```
Display GCC Data                              GC ID: 12345
Collected:  03/11/88   08:54

                              GC DATA AVERAGES

CODE   NAME   STR  CODE  NAME      CURRENT       PREVIOUS  24Hr Avg Time
 183 24HRAV1   1   162 BTU-DRY   1.115096E+03  1.108727E+03    07:30
 184 24HRAV2   1   163 BTU-SAT   1.095692E+03  1.089435E+03
 185 24HRAV3   1   164 S.G       6.494949E-01  6.460631E-01
 186 24HRAV4   1   100 METHANE   8.755336E+01  8.787238E+01
 187 24HRAV5   1   101 ETHANE    5.908370E+00  5.708851E+01
 188 24HRAV6   1   102 PROPANE   2.532540E+00  2.448807E+00
 189 24HRAV7   1   103 I-BUTANE  3.343648E-01  3.116435E-01
 190 24HRAV8   1   104 N-BUTANE  6.806212E-01  6.459483E-01
 191 24HRAV9   1   105 IPENTANE  1.637903E-01  1.498236E-01
 192 24HRAV10  1   106 NPENTANE  1.709189E-01  1.531789E-01
 193 24HRAV11  1   107 NEO C5    6.971052E-03  5.612739E-01
 194 24HRAV12  1   108 C 6 +     1.986632E-01  1.858200E-01
 195 24HRAV13  1   114 NITROGEN  1.714955E+00  1.786687E+00
 196 24HRAV14  1   117 C O 2     7.734423E-01  0.000000E+00
 197 24HRAV15  0   255           0.000000E+00  0.000000E+00

   F1: Next Data Set   F2: Disp 24 Hr Avg   F3: Disp Alarms   F4: Finished
```

Pressing the F1, F2, F3, and F4 function keys from the data screen accomplishes the following:

- F1: Displays the next data set stored for this location.
- F2: Displays the 24-hour average data from the Display Alarms Screen.
- F3: Displays the Alarms Screen from the 24-hour Averages Data Screen.
- F4: Exits the Data Display Mode.

4.4.2.2 Alarms Screen

A typical Alarms screen looks like this:

```
Display GCC Data                              GC ID: 12345
Collected:  02/24/88   08:54

                        A C T I V E   A L A R M S

A/D O LOW                 A/D 0 HIGH              A/D 1 LOW
A/D 1 HIGH                A/D 2 LOW               A/D 2 HIGH
A/D CAL LOW               A/D CAL HIGH            D/A 1 LOW
D/A 1 HIGH                D/A 2 LOW               D/A 2 HIGH
POWER FAILURE             RF % DEVIATION          PREAMP FAILURE
ADJUST PREAMP
```

4.4.2.3 Display Format for 24-Hour Average Data

The 24-Hour Average Data are displayed in the following format.

GCC ID: GCC ID is the Gas Chromatograph Controller identification number.

COLLECTED: The date and time of collection of the data set from the Model 2251 G.C.C.

CODE: CODE is the component code as defined in the Model 2251 G.C.C.

NAME: NAME is an alphanumeric name of a component or property as defined in the Model 2251 G.C.C.

STR: STR is the stream number with which the average data are associated.

CURRENT: CURRENT is the average of the data described by the variable name since the 24-hour average time.

PREVIOUS: PREVIOUS is the 24-hour average value during the 24-hour average time.

24Hr Avg Time: 24Hr Avg Time is the beginning time from which the 24-hour average is calculated.

4.4.2.3 Format Active Alarms Display

Active Alarms are displayed in the following format.

GCC ID: GCC ID is the Gas Chromatograph Controller identification number.

COLLECTED: The date and time of collection of this data set from the G.C.C.

ACTIVE ALARMS: A list of the alarm conditions that are active at the time of this acquisition from the G.C.C.

4.4.3 Printing GCC Data

The F3 function key prints G.C.C. data from the Data Log Menu screen discussed in section 4.4.2. GCC data are printed by following the procedure below.

a. Press the F3 key. A screen similar to the following screen appears.

```
Print GCC Data                                        GC ID: 12345
Collected:  02/24/88   08:56

                              GC DATA AVERAGES

  CODE   NAME   STR  CODE  NAME      CURRENT       PREVIOUS  24Hr Avg Time
   183 24HRAV1   1   162 BTU-DRY   1.115096E+03  1.108727E+03    07:30
   184 24HRAV2   1   163 BTU-SAT   1.095692E+03  1.089435E+03
   185 24HRAV3   1   164 S.G       6.494949E-01  6.460631E-01
   186 24HRAV4   1   100 METHANE   8.755336E+01  8.787238E+01
   187 24HRAV5   1   101 ETHANE    5.908370E+00  5.708851E+01
   188 24HRAV6   1   102 PROPANE   2.532540E+00  2.448807E+00
   189 24HRAV7   1   103 I-BUTANE  3.343648E-01  3.116435E-01
   190 24HRAV8   1   104 N-BUTANE  6.806212E-01  6.459483E-01
   191 24HRAV9   1   105 IPENTANE  1.637903E-01  1.498236E-01
   192 24HRAV10  1   106 NPENTANE  1.709189E-01  1.531789E-01
   193 24HRAV11  1   107 NEO C5    6.971052E-03  5.612739E-01
   194 24HRAV12  1   108 C 6 +     1.986632E-01  1.858200E-01
   195 24HRAV13  1   114 NITROGEN  1.714955E+00  1.786687E+00
   196 24HRAV14  1   117 C O 2     7.734423E-01  0.000000E+00
   197 24HRAV15  0   255           0.000000E+00  0.000000E+00

F1: Next Data Set   F2: Disp 24 Hr Avg   F3: Disp Alarms   F4: Finished
```

Pressing the F1, F2, and F3 function keys from this display accomplishes the following:

F1: Displays the next data set stored for this location.

F2: Prints the report for the displayed data set on the system printer. A typical report is illustrated below.

F3: Exits the print G.C.C. data mode and returns to the GCC Data Access Menu.

```
GC ID:  12345
Collected: 02/24/88  08:56

                    G C  D A T A  A V E R A G E S

 24Hr Avg Time: 16:00
   CODE   NAME   STR  CODE  NAME      CURRENT       PREVIOUS
    183 24HRAV1   1   162 BTU-DRY   1.115096E+03  1.108727E+03
    184 24HRAV2   1   163 BTU-SAT   1.095692E+03  1.089435E+03
    185 24HRAV3   1   164 S.G       6.494949E-01  6.460631E-01
    186 24HRAV4   1   100 METHANE   8.755336E+01  8.787238E+01
    187 24HRAV5   1   101 ETHANE    5.908370E+00  5.708851E+01
    188 24HRAV6   1   102 PROPANE   2.532540E+00  2.448807E+00
    189 24HRAV7   1   103 I-BUTANE  3.343648E-01  3.116435E-01
    190 24HRAV8   1   104 N-BUTANE  6.806212E-01  6.459483E-01
    191 24HRAV9   1   105 IPENTANE  1.637903E-01  1.498236E-01
    192 24HRAV10  1   106 NPENTANE  1.709189E-01  1.531789E-01
    193 24HRAV11  1   107 NEO C5    6.971052E-03  5.612739E-01
    194 24HRAV12  1   108 C 6 +     1.986632E-01  1.858200E-01
    195 24HRAV13  1   114 NITROGEN  1.714955E+00  1.786687E+00
    196 24HRAV14  1   117 C O 2     7.734423E-01  0.000000E+00
    197 24HRAV15  0   255           0.000000E+00  0.000000E+00

                          A C T I V E  A L A R M S

    A/D O LOW               A/D 0 HIGH             A/D 1 LOW
    A/D 1 HIGH              A/D 2 LOW              A/D 2 HIGH
    A/D CAL LOW             A/D CAL HIGH           D/A 1 LOW
    D/A 1 HIGH              D/A 2 LOW              D/A 2 HIGH
    POWER FAILURE           RF % DEVIATION         PREAMP FAILURE
    ADJUST PREAMP
```

Typical Printout of a Model 2251 G.C.C. Data Set

SECTION 5

EVENT LOG ACCESS

5.0 ACCESSING EVENT LOGS

5.1 EVENT LOG STORAGE

Event logs are stored in the location computer unit of the SolarFlow Plus on-site computer.

5.2 EVENT LOG ACCESS PROCEDURE

Event logs are accessed from the Main menu of the SFDAS program. In addition, the location/unit must be specified in order to access an individual event log. Access to an event log and selection of the location/unit of the log is accomplished using the following procedure.

a. Press the F2 function key from the main menu (shown below) to invoke the Event Log Access menu.

```
SolarFlow Plus/2251 G.C.C. Data Acquisition System

                    Main Menu Options

                F1: SF+ Data Log/G.C.C. Data Access
                F2: Event Log Access
                F3: Change Acquisition Directory
                F4: Automatic Data Collection
                F5: Direct Channel Access Mode
               ESC: Exit

                      Your Choice?
```

When the F2 key is pressed, the following screen appears.

```
                    Event Log Access

                        Select Loc/Unit:

                F1: Location/Unit  Name # 1
                F2: Location/Unit  Name # 2
                F3: Location/Unit  Name # 3
                F4: Location/Unit  Name # 4
      PG-UP / PG-DN: Previous/Next 10 Units
          ESC/ALT-X: Return to Previous/Main Menu
                        Your Choice?
```

b. Press the function key that corresponds to the location/unit for the event log to be accessed. The screen displays a maximum of ten Locations at one time. Pressing the **Pg-Up** and **Pg-Dn** keys on the PC keyboard displays previous or next ten locations respectively. The following screen appears when the appropriate function key is pressed.

```
                Location: "Name from above"
                     Event Log Access

                         Menu Options:

                F1: Upload Log
                F2: Display Log
                F3: Print Log
           ESC/ALT-X: Return to Previous/Main Menu

                        Your Choice?
```

The three data choices provided by the Event Log Access menu are described as follows.

5.2.1 Updating the Event Log

The event log is uploaded using the F1 key function key. Uploading is accomplished using the following procedure.

a. Press the F1 key and the following screen appears, which requests entry of the security code.

```
Upload Event Log                                  Location: "Name from above"

                    Enter Security Code:  [_ _ _ _ _ _ _ _ _ _]
```

b. Enter the location security code on the PC keyboard. After entry of the security code, the message "Working" is displayed on the monitor. The selected location/unit is contacted and the display indicates that the event log entries are being loaded. When uploading is complete, information about the upload is displayed, e.g., success of upload, time on-line, number of log entries uploaded, and the last log entry uploaded. The data uploaded during this procedure is placed on the computer drive specified on the **ALT S** set-up screen discussed in section 2.3.

c. Press the **SPACE** bar to return to the Event Log SFDAS Menu options screen.

5.2.2 Event Log Display

An event log in the SolarFlow Plus contains up to 100 events. The earliest event is dropped from the list as events are added that exceed 100. The SFDAS can upload up to 100 events or all events in a SolarFlow Plus event log. If the Clear Log Flag has been set to zero, a backup of the event log is created and saved in a fresh log file. Otherwise, the SolarFlow Plus event log is added to the existing log file. In this instance, duplicate event items are possible. The PC can display only 16 event log entries at a time. The screen shows the procedure for viewing events preceding and following the events being displayed.

5.2.2.1 Event Log Display Procedure

To look at the event log uploaded in section 5.2.1, proceed as follows:

a. Press the F2 function key. The next screen will request the beginning date and time. Then a display similar to the following may appear.

Display Event Log — Location: " Name from above"

Date	Time	Description	Number	Value #1	Value #2
07/31/87	05:01:05	Loc. Block Download UntCM			STKD DP WATER
07/31/87	05:01:29	Loc. Block Download UntNm		BLANK UNIT	CELL 1
07/31/87	05:01:30	Unit Block Download UntLb			
07/31/87	05:01:37	Loc. Block Download UntId		BLANK ID	123
07/31/87	05:01:59	Channel Fixed Perm	20	553	1
07/31/87	10:05:15	User Logged On		120	
07/31/87	10:05:36	Event Log Uploaded		0000000000	8707311005
07/31/87	10:05:46	Data Log Upload	0	0001010005	8707311005
08/03/87	11:59:14	User Logged On		120	
08/03/87	12:00:23	Channel Fixed Temp	23	41.0	41.0
08/03/87	12:01:28	Calibrate Value #0	23	0.0	0.0
08/03/87	12:01:28	Calibrate Value #1	23	100.0	100.0
08/03/87	12:01:28	Calibrate Value #2	23	0.5	0.5
08/03/87	12:01:31	Channel Unfixed Temp	23	40.1	40.1

5.2.2.2 Event Log Format

The header block of data details the collection date and time, the Location ID and name, as well as details the column headers for each of the events that are listed. Each Event that occurs within SolarFlow Plus will be date and time stamped. The log will list a description for each type of event. The column titled "Number" serves multiple purposes depending on the event type; it may be an alpha description of the parameter changed, the channel number, or may be blank in some cases. The column titled "Value #1" relates to the value in the parameter prior to the event and the value under "Value #2" relates to the new value of the parameter after the event. See the listing of event log types for more information.

The first four items under the header block relate to the set up operation performed on the SolarFlow Plus during the start up sequence with the HHDT. The first event indicates that the calculation module "STKD DP WATER" was activated. The second event indicates that the Unit Name was changed from "BLANK" to "CELL 1". The unit name was downloaded to the slave in the third entry and the fourth entry changed the Unit ID from "BLANK" to "123". The Column headers Value #1 and Value #2 relate to before and after values respectively.

The fifth item in the log shows that channel number 20 was placed in the fixed mode. Channel 20 for this application was the meter pressure transmitter. The value of that channel was fixed as shown in the value #2 column as 1.

The sixth item shows that a user logged on with security code 120 at the displayed date and time. In lines seven and eight the user collected an Event Log and a Data log. The Value #1 and #2 parameters relate to the start and stop date/time frames for the collections, the "0000000000" under value #1 for the Event Log signify that the first entry collected was at the startup time of the SolarFlow Plus which is defaulted to all zeros. The key for decoding the ten digit number is as follows:

```
Y Y M M D D H H M M
8 7 0 7 3 1 1 1 0 0
```

This represents the following Date/Time July 31, 1987 11:00 am.
Some Date/Time values will be 14 digits in length, for example when a time change is made the user would see a value similar to the following:

```
Y Y M M D D H H M M S S d d
8 7 0 8 0 2 0 6 3 9 3 0 0 1
```

This represents the following Date/Time/Day of Week
August 2, 1987, 06 hour, 39th minute, 30th second, first day of the week. The d d relates to the day of the week; 01 = Sunday, 07 = Saturday.

Lines 9 through 14 show a typical analog input calibration sequence where the operator logged onto the unit and proceeded to calibrate channel 23, which in this example is a differential pressure analog input. The value for channel 23 was temporarily fixed in line ten to 41.0 inches H2O which was the live value at the time the calibrate menu was entered. Lines 11, 12, and 13 display the Low, High, and Low Bias calibration points for the calibrated channel number 23. Line 11 relates to the Low calibration point, line 12 equates to the High calibration point, and line 13 relates to the Low Bias calibration point. The values under columns "Value #1" and "Value #2" relate to the raw value sensed by SolarFlow Plus, and the value given to SolarFlow Plus by the user via the HHDT during the calibration sequence. Line 14 indicates the date and time that the channel being calibrated was returned to its previous state along with a present value for the channel.

5.2.2.3 Event Log Types

Following is a list of event log types, detailing their number, description, vector and value fields.

Type	Description	Vector	Value 1	Value 2
0	User Logged on	none	security code	none
1	Channel set	CH#	before	after
2	Alarm Acknowledged	alarm #	none	none
3	Alarm enabled	alarm #	none	none
4	Alarm disenabled	alarm #	none	none
5	Alarm activated	alarm #	none	none
6	Alarm deactivated	alarm #	none	none
7	Reserved			
8	Config. downloaded	ID (0-9,L)	Success (Failure)	none
9	Reserved			
10	Unit clock synch.	ID (0-9)	Slave time	Subhost time
11	Low scale changed	CH#	before	after
12	High scale changed	CH#	before	after
13	Time change	7	before	after
14	Data log upload	ID (0-9)	start time	end time
15	Event log upload	none	start time	end time
16	System warm start	none	warmstart time	none
17	System cold start	none	coldstart time	none
18	System fault	none	none	none
19	Calibrate value #0	CH#	raw value	given value
20	Calibrate value #1	CH#	raw value	given value
21	Calibrate value #2	CH#	raw value	given value
22	Alarm low value set	CH#	before	after
23	Alarm high value set	CH#	before	after
24	Alarm alt. value set	CH#	before	after
25	Loc. block download			
	Calculation module	UNTCM	none	module name
	Location name	LOCNM	before	after
	Location ID	LOCID	before	after
	Sec code list	SECTY	none	none
	Zero report list	USRRP	none	none
	Unit name	UNTNM	before	after
	Unit ID	UNTID	before	after
	Log date upload	UPDTE	before	after
	Telephone list	TELE1	none	none
	Alarm Configuration	ALMCN	none	none
26	Unit block download			
	Log Interval	LOGIN	before	after
	Contract Hour	CTRHR	before	after
	Volume Option	CMOPT	before	after
	Unit Name	UNTLB	none	none
	Log definition	LOGDF	none	none
	Initialization Flag	IFLAG	none	none
27	Channel fixed temp.	CH# (19-26)	before	after
	All A/D’s temp fixed	0	none	none
28	Channel fixed perm.	CH# (19-26)	before	after
29	Channel unfixed temp.	CH# (19-26)	before	after
	All A/D’s temp fixed	0	none	none
30	Channel unfixed perm.	CH# (19-26)	before	after
31	Calib. over-deviation	CH#	none	none

5.2.3 Printing the Event Log

The F3 function key is used to print the event log on a printer connected to the IBM-compatible computer. The event log is printed by following the procedure below.

a. Press the F3 key on the PC keyboard. A beginning and ending date and time is requested. Then the SFDAS program locates the event log file and outputs it to the printer. When the event log printout is complete, the Event Log Menu Options screen is displayed on the monitor. The following illustrates the printout of an event log.

```
Event Log List                                                Page 1
Location: " From above"

Date     Time      Description          Number  Value #1      Value #2
_______  ________  ___________________  ______  ____________  ______________

07/31/87 05:01:05  Loc. Block Download UntCM              STKD DP WATER
07/31/87 05:01:29  Loc. Block Download UntNm BLANK UNIT   CELL 1
07/31/87 05:01:30  Unit Block Download UntLb
07/31/87 05:01:37  Loc. Block Download UntId  BLANK ID        123
07/31/87 05:01:59  Channel Fixed Perm     20        553                1
07/31/87 10:05:15  User Logged On                    120
07/31/87 10:05:36  Event Log Uploaded          0000000000     8707311005
07/31/87 10:05:46  Data Log Upload           0 0001010005     8707311005
08/03/87 11:59:14  User Logged On                    120
08/03/87 12:00:23  Channel Fixed Temp     23       41.0             41.0
08/03/87 12:01:28  Calibrate Value #0     23        0.0              0.0
08/03/87 12:01:28  Calibrate Value #1     23      100.0            100.0
08/03/87 12:01:28  Calibrate Value #2     23        0.5              0.5
08/03/87 12:01:31  Channel Unfixed Temp   23       40.1             40.1

End-Of-Log-File
```

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SECTION 6

AUTOMATIC DATA COLLECTION

6.0 COLLECTING DATA AUTOMATICALLY

The SFDAS program can automatically collect data from as many as 100 SolarFlow Plus units and Gas Chromatograph Controllers. Collection may be scheduled at specific times of the day, at specified intervals or immediately. The collection sequence may be set up to repeat continuously or it can be set up to execute collection once and terminate.

NOTE: Before beginning an extended automatic collection session, make sure that ample room is available on the disk for your log files. You may collect data from up to 10 filenames at one time.

6.1 AUTOMATIC DATA COLLECTION

The Automatic data collection can be accessed from the Main menu of the SFDAS program using the F4 function key. The following procedures presuppose that you have set up automatic data collection and established the data desired. If you have <u>not</u> defined your automatic data collection setup, proceed to section 6.2 and perform your set-up procedures first.

a. Press the F4 function key on the Main Menu. The following screen appears.

```
                    Automatic Data Collection

                            Menu Options:

                    F1: Start Automatic Data Collection
                    F2: Change Automatic Collection Control File

                ESC/ALT-X: Return To Previous/Main Menu

                   Your Choice?
```

b. Press F1; the screen asks for a file name. Enter the file name(s) to start the automatic data collection.

```
Automatic Data Collection

        Enter Automatic Collection Control Filename:

        Default Automatic Collection Control File is:  TMP2.ACL

        List of Automatic Collection Control Files are:

        TMP2.ACL            TMP1.ACL
```

Another method of obtaining automatic data collection is to start from the DOS prompt by typing:

SFDAS AUTOCL "Filename 1...Filename 10" <ENTER>

The program automatically executes automatic data collection. To exit the SFDAS program automatically after collection, place a "/E" after your list of Filename(s); type:

SFDAS AUTOCL "Filename" /E <ENTER>

Execution of the automatic collection sequence defined in the Collection Control File begins immediately. Progress of the sequence is provided by messages displayed on the monitor. The sequence can be aborted by pressing the escape key. If the sequence is not aborted, it continues until it encounters the end of the collection control file(s).

6.2 AUTOMATIC DATA COLLECTION CONTROL FILE SETUP

Before Automatic Data Collection can be started, the collection sequence must be defined by creating an automatic collection control file. An automatic collection control file is created using function key F2 from the Automatic Data Collect Options menu. It would be a good idea to become familiar with the edit and insert mode commands (sections 6.2.1 and 6.2.2) before starting your setup.

6.2.1 Edit Mode

Changes can be made to the collection control file while in the EDIT mode. Changes are made by positioning the cursor on the line at which the change is to be made. The cursor is positioned with the PgUp, PgDn, Up arrow, and Down arrow keys on the PC keyboard. The change is made by pressing a function key (F1 through F3) shown at the bottom of the screen. A brief description of each of the function keys is provided as follows.

F1-INSert -- Pressing F1 returns the program to the INSERT mode described in section 6.2.2. Lines added in the insert mode follow the record adjacent to the cursor at the time F1 is pressed.

F2-DELete -- Pressing F2 deletes the line adjacent to the cursor from the collection control file.

F3-CHG -- Pressing F3 provides for changing the current line in the collection control file. After pressing F3, operation of the program continues as in the INSERT mode except that the command entered replaces the line adjacent to the cursor at the time F3 is pressed. While in the F3-CHG mode, the word CHANGE is displayed on the monitor to the right of the command line being changed.

F4-FINISH -- When editing of the collection control file is completed, pressing F4 closes the collection control file and returns the program to the Main Automatic Data Collection screen.

6.2.2 Insert Mode Commands

F1-COLLECT/POLL -- This command enables the specification of a selected log or logs so that this data may be collected from a particular Location/Unit. When the F1 key is pressed, an additional menu appears which allows the selection of the type of log that will be collected. One can choose to collect the Data, Event, Channel, Miscellaneous, or All logs. After the log type is selected, a prompt requests a 4-character abbreviated location/unit identifier for the desired location/unit. This identifier is checked by the SFDAS program to ensure that it exists in the Acquisition Directory. If the identifier does not exist in the directory, an error message is displayed. Note that this entry is case sensitive, e.g. TMP2, not tmp2. If the Location/Unit in two successive COLLECT commands has exactly the same telephone number, the SFDAS program does not hang up the telephone until data from both locations/units have been collected. If the location is a Gas Chromatograph, any COLLECT/POLL selection will cause the chromatograph log to be uploaded.

F2-PAUSE -- This command allows a period of time to be specified for interrupting the automatic collection sequence. When the time period expires, automatic collection continues. When the F2 key is pressed, a prompt requests the desired time in hours and minutes in the format, HH:MM. (The time must be entered as 02:30, not 2:30.)

F3-AWAIT -- This command is similar to PAUSE (F2) except that AWAIT interrupts automatic collection until a specific time-of-day rather than for a period of time that can occur at any time-of-day. When the F3 key is pressed, a prompt requests the time-of-day when automatic collection is to continue in hours and minutes (using the 24-hour time format, HH:MM.) For example, if 15:00 is entered, automatic collection is interrupted when the command is encountered and resumes at 15:00 (3:00pm).

A wild card hour may be used by entering a double asterisk (**) for the hour. When the program encounters the AWAIT command with "**" entered for the hour, the current minutes are compared to the minutes in the AWAIT command. If the current minutes are greater than or equal to those in the AWAIT command, the SFDAS program makes the following hour (the current hour plus one) the hour for executing the AWAIT command. If the current minutes are less than the minutes in the AWAIT command, the program makes the current hour the time for executing the command. This allows for independently defining periodic collection sequences regardless of the starting time.

F4-REPEAT -- The REPEAT (F4) command provides for applications in which automatic collection runs continuously. When the program encounters the REPEAT command, the automatic collection sequence starts at the beginning of the collection control file.

F5-IF-ENDIF -- A block which is only executed at certain times or on certain dates can be set off by the IF TIME/DATE and ENDIF statements. When the F5 key is pressed, an additional menu appears in which TIME, DATE or ENDIF can be selected. If the user selects time or date, a prompt requests the entry of a time or date value. Time is entered in HH:MM form and date is entered in MM/DD form. The HH and DD parameters may be replaced by the wildcard parameter, **. All statements following an IF up to the matching ENDIF statement, will be executed only if the current date matches the date in the IF statement. For time values, the statements within the block will be executed once within the hour following the time given in the IF statement. Each IF must have a matching ENDIF, and IF blocks may be nested. The autocollect editor cannot be exited until there is a matching ENDIF statement for each IF.

F6-DOS -- The DOS (F6) command provides for inserting any DOS command, batch file (*.BAT), or executable file (*.EXE or *.COM) into the automatic collection file run stream. When this option is selected, the program requests the entry of a filename (*.EXE or *.BAT) to run or a DOS command. The filename or DOS command may be up to 40 characters in length. No error checking is provided for this input and care must be taken to ensure that the entry is correct. As the program executes the collection file statements, the DOS statement is executed in whatever logical sequence it has been entered.

NOTE: Ensure that the execution of a DOS statement allows for returning to the SFDAS program. If for any reason the spawned DOS call requires an input by the user, the system waits for that input before continuing execution. The subsequent return to the SFDAS automatic collection sequence will be delayed accordingly.

F7-PRNT -- The PRNT (F7) command provides for printing a report on the printer for the SolarFlow Plus or a Gas Chromatograph Controller. For SolarFlow Plus logs, one can select to print the Data, Event, Miscellaneous, Channel or all logs. Any of these selections will allow the printing of a Gas Chromatograph log.

NOTE: If multiple data sets are stored in the file, a report is printed for each data set.

ESC-EXIT -- Pressing the ESCAPE (Esc) key on the PC keyboard puts the program into the EDIT mode.

6.2.3 Control File Setup

a. Press the F2 function key on the main Automatic Data Collection Menu. The following screen is displayed on the monitor.

```
Change Automatic Collection Control File

  Enter Automatic Collection Control Filename:

  Default Automatic Collection Control File is:  TMP2.ACL

  List of Automatic Collection Control Files are:

    TMP2.ACL            TMP1.ACL
```

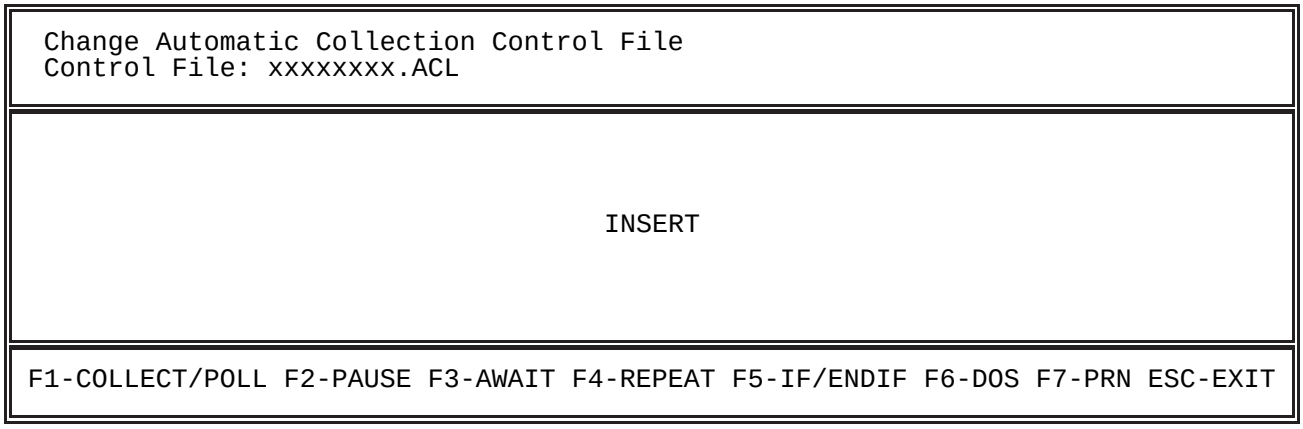
b. To use the default control file, enter a carriage return. Enter a filename without any extension to identify the collection control file to be created. This name must be a legal DOS filename. If a control file does not already exist with that name, one is created in the current directory and the following screen is displayed on the monitor.

```
Change Automatic Collection Control File
Control File: xxxx.xxx

            1       AWAIT   08:00
            2        DAN1
            3       PAUSE   01:00
            4        DAN3
            5       PAUSE   02:00
            6        DAN4
            7       AWAIT   18:00
            8        DAN6
            9        DAN7
           10       REPEAT

F1-INS F2-DEL F3-CHG F4-FINISH PGUP-PREV10 PGDN-NEXT10 UPARR-PREV DNARR-NXT
```

The collection control file shown in the previous screen results in the following sequence of automatic collection events. Collection is not begun until 08:00 AM. At this time, Data and Event Logs are collected from Location/Unit DAN1. Collection then pauses for an hour. After this one-hour period, data is collected from Location/Unit DAN3, then collection is interrupted for two hours. After the two-hour pause, data is collected from Location/Unit DAN4. Collection is then suspended until 18:00 (6:00 PM). At 18:00, data is collected from Location/Unit DAN6, followed immediately by collection from Location/Unit DAN7. The REPEAT command restarts operation at the beginning of the collection control file, which causes the sequence to wait till 08:00 on the following day to begin data collection again.

c. Now the program is in the INSERT mode. Make entries to the collection control file. The entries are added in the file following the entry adjacent to the cursor. The seven function-key commands shown at the bottom of the screen are available for the collection control file. Use the HELP command if needed. For a brief description of each of the Insert Mode commands, refer to section 6.2.2. Press F1-INS to obtain the second screen in the INSERT mode.

d. The second screen in the INSERT mode (F1-COLLECT/POLL) allows you to program the collected data from a particular location that is convenient for your use. Refer to section 6.2.1 for command descriptions.



e. After selecting the sequence in which you would like the data collected, Press F1-COLLECT/POLL to obtain the screen that enables you to select the DATA or EVENT, etc. that you desire.

```
Change Automatic Collection Control File
Control File: xxxxxxxx.ACL

                                INSERT

        F1-DATA  F2-EVENT  F3-MISC  F4-CHANNEL  F5-AL  ESC-ABORT
```

f. After completing your changes, return to the previous screens and press F4-FINISH to save your changes and/or F7-PRN to print the data requested.

SECTION 7

SFDAS SYSTEM DISKETTE FILES

7.0 SOLARFLOW PLUS DATA ACQUISITION SYSTEM DISKETTE FILES

The SOLARFLOW PLUS DATA ACQUISITION SYSTEM (SFDAS) program is provided on one 3.5" diskette. The software package is designed to run on IBM DOS version 2.1 or later. Backup of the Daniel-supplied diskette is essential. (Consult the DOS operating manual for diskette backup instructions.) The original SFDAS disks should be stored in a safe location. The original data files are compressed into distribution library files.

After using the INSTALL program, the following tables show the files included on the original diskettes after installation.

7.1 SFDAS FILES AFTER INSTALLATION

Filename	File Description
BRUN30 EXE	The executive program used to run the system
OMAUTOCL EXE	The Automatic Data Collection program
OMCONFIG EXE	The Change Location program
OMDATLOG EXE	The DATA LOG Access program
OMDCA EXE	Direct Channel Access Program
OMEVTLOG EXE	The EVENT LOG Access program
OMHELP DAT	Data file for the various HELP screens in OMS
SFDAS EXE	The executive program that initiates the SolarFlow Plus Data Acquisition System.
OMDCTDIR DAT	Dictionary directory file
OMDICTA3 DAT	AGA3 applications dictionary
OMDICTA7 DAT	AGA7 applications dictionary
OMDICTDT DAT	Dual applications dictionary
OMDICTTS DAT	Dual triple TS dictionary
OMDICT83 DAT	AGA3 applications dictionary for Model 2480
OMDICT87 DAT	AGA7 applications dictionary for Model 2480
OMDICT73 DAT	AGA7/3 alternate application dictionary
OMDICTVP DAT	AGA3 dual with valve positioning application dictionary
OMDICTID DAT	AGA3 independent dual application dictionary
OMDICT77 DAT	2470 AGA7 enhanced dictionary
OMDICT7E DAT	2470 AGA3 enhanced dictionary
OMDICT8E DAT	2480 AGA3 enhanced dictionary
OMDICT8F DAT	2480 AGA7 enhanced dictionary

Filename	File Description
OMDICTGC DAT	Application dictionary for the following: Single orifice Dual orifice Triple orifice Stacked single orifice Stacked dual orifice Stacked triple orifice Bi-directional orifice Dual orifice - common pressure/temperature Dual orifice - separator temperature
K2L EXE	Upgrade Utility
LAW EXE	Upgrade Utility
README EXE	Document viewer
SFDAS_? DOC	Document containing specifics about current and previous revisions

Application dictionaries are available for applications other than those listed in the preceding files.

7.2 FILES BUILT DURING EXECUTION OF PROGRAM SEGMENTS

The files shown below with an asterisk (*) after the file name include a four-character abbreviated name of the LOCATION computer, which is designated xxxx in the following examples. The abbreviated name entered during execution of the SFDAS program replaces xxxx.

Filename	File Description
OMxxxxEL DAT*	Lists the items in the EVENT LOG
Mxxxx00 LOG*	Contains the data uploaded from the SOLARFLOW data log or from the Model 2251 G.C.C. 24-hour average data and active alarms
OMMAINFL DAT	A sequential list of the Locations accessed by SFDAS
MCONFIG DAT	The data file that includes the **ALT S** system setup
xxxxxxx ACL	Automatic collection control file
OMxxxx00.MDL*	Stores the information which specifies a miscellaneous data log for a particular location
OMxxxx00.CDL*	Stores the information which specifies a channel data log for a particular location
Mxxxx00.CNL*	Stores all channel log data uploaded by SFDAS for a particular location
OMxxxx00.DM	Files reserved for future programs
OMxxxxAP.DAT	Files reserved for future programs

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SECTION 8

DIRECT CHANNEL ACCESS MODE

8.0 ACCESSING CHANNELS IN SOLARFLOW PLUS

Active channels in SolarFlow Plus may be accessed directly in this mode to change values, view the Channel Zero Report, enable/disable and acknowledge alarms.

8.1 SOLARFLOW PLUS CHANNEL ACCESS PROCEDURE

The general procedure for accessing and changing values in individual channels in SolarFlow Plus is very similar to the methods used in preceding sections. To enter Direct Channel Access Mode, the user must select function key F5 from the Main Menu. The location/unit and a security code or password must be specified in order to obtain access to an individual value. Any change may be made using the procedure outlined in section 2.4. The Channel Zero report may be viewed but not changed. Now press F5 from the following Main Menu to obtain the Direct Channel Access Mode.

```
SolarFlow Plus/2251 G.C.C. Data Acquisition System

                    Main Menu Options

          F1: SF+ Data Log/G.C.C. Data Access
          F2: Event Log Access
          F3: Change Acquisition Directory
          F4: Automatic Data Collection
          F5: Direct Channel Access Mode
         ESC: Exit

                       Your Choice?
```

The Location/Unit Name/No. of the SolarFlow Plus that will be contacted is specified in the next menu. The standard SFDAS security code screen (not shown) will follow after the location screen.

Upon selection, SFDAS attempts to connect with the location as shown in the following sample screen.

```
        SolarFlow Plus/2251 G.C.C. Data Acquisition System
                    Direct Channel Access Mode

                          Select Loc/Unit:

              F1:  TEST

              F2:  TST2                    test2

    PG-UP / PG-DN:  Previous/Next 10 Units
        ESC/ALT-X:  Return To Previous/Main Menu
                          Your Choice?
```

8.2 SOLARFLOW PLUS USER REPORT

After entering your security code or password and going on-line with the desired SolarFlow Plus, select the option desired from the following screen. The SolarFlow Plus remains on-line with the location until the user exits from the Direct Channel Access Mode menu.

```
            Location: "Name"      Unit: "Name"
        SolarFlow Plus/2251 G.C.C. Data Acquisition System

                          Direct Channel Access Menu Options:

                    F1:  SolarFlow+ User Report

                    F2:  Display/Edit Channels

                    F3:  Acknowledge/Enable/Disable Alarms

                    F4:  Change RTU Time

                   ESC:  Exit

                          Your Choice?
```

8.2.1 SolarFlow Plus User Report Access

Pressing F1 in the main Direct Channel Access Mode menu allows the user to view the current SolarFlow Plus user report. This "Snapshot" report contains all the channels configured to be displayed on the front panel of the SolarFlow Plus during operation. The following screen shows an example of a user report. To update the displayed report from the SolarFlow Plus, press F1. To return to the main Direct Channel Access Mode menu, press F2.

```
          Location: "Name"        Unit: "Name"
    SolarFlow Plus/2251 G.C.C. Data Acquisition System


          DATE 11/15  TIME 12:04
          020 FLOW PRES    273.3 PSIG
          021 FLOW TEMP      82 DEG F
          042 TOT C VOL   1272.4 MCF




          F1: Update    F2: Exit
```

NOTE: 2480 SolarFlow Applications firmware do not implement redefinition of the User Report List, and SFDAS will always report a default list.

8.3 DISPLAY/EDIT CHANNEL

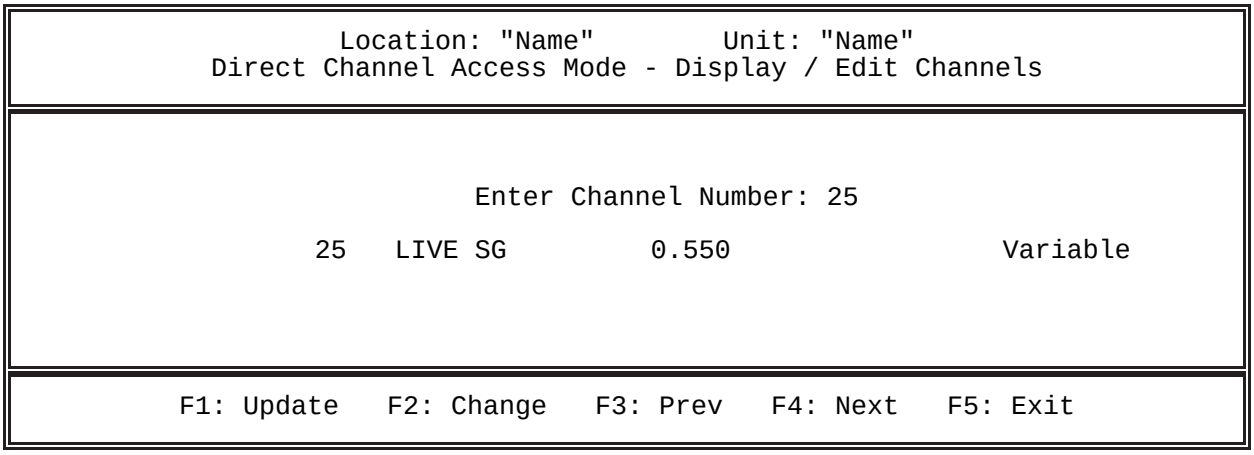
In the Display/Edit Channels screen, the user must input the channel number to display. Valid channel numbers are one through 240; however some channels may not exist in a particular SolarFlow Plus application. If a channel is entered that is not used, an error message will be displayed. Once the channel number has been entered, SFDAS will acquire the data for that channel. Press F2 from the Direct Channel Access Mode main menu to display and edit channels. Specify the channel No. on the following screen.

```
          Location: "Name"          Unit: "Name"
    Direct Channel Access Mode - Display / Edit Channels


                    Enter Channel Number: __
```

The first screen in the Display/Edit sequence allows the operator to acquire the latest data update on a channel of a SolarFlow Plus or exit to the previous menu.

After the channel No. is entered, the screen will show the latest snapshot data from that channel similar to the following:



If you desire to look at another channel, press F1:, enter the new channel No. from the Channel request screen and continue. Alternately scroll rapidly through the channels by pressing F3: Prev or F4: Next. After a slight pause, SFDAS will acquire the channel information for the selected channel.

If you desire to change any data, press F2: to obtain the following screen:

```
                Location: "Name"         Unit: "Name"
        Direct Channel Access Mode - Display / Edit Channels


                       Enter Channel Number: 25

                25   LIVE SG         0.550 <-              Variable
```

When the displayed value from this screen is to be changed, proceed as follows:

a. Move the cursor to the value to be changed and press HOME. Change the value and press <ENTER>.

b. Move the cursor to the Channel Mode and press HOME until the desired mode shows up (Variable or Fixed).

c. After all desired entries are made, press END. The selections F1: Transmit and F2:Exit will appear.

d. If the changes are to be made in the SolarFlow Plus, press F1: Transmit. If not, press F2: Exit to leave this screen without transmitting the new data.

Channels which are in Variable mode use the current value detected by the SolarFlow Plus sensor or calculated by SolarFlow Plus. Channels which are Fixed retain the value input by the user until the next time the user changes the value. Once the data has been entered, the user can transmit (F1:TRANSMIT) the change to the SolarFlow Plus. Press F2: EXIT to return to the main Channel Edit/Display menu without changing or saving any data.

8.4 ALARM DISPLAY

To display alarms, press F3: Acknowledge/Enable/Disable Alarms at the main Direct Channel Access menu. A screen similar to the following screen is displayed.

```
                Location: "Name"          Unit: "Name"
              Direct Channel Access Mode - Alarm Mode

      NO.  NAME         ENAB? STAT ACKNOW   LO         HI         ALT

       1   BATTERY LO   YES   OFF  N/A      10.8         0        0
       2   METR PRES1   YES   OFF  N/A         0      1.01        0
       3   METR PRES2   YES   OFF  N/A         0      1.01        0
       4   METR TEMP    YES   OFF  N/A         0      1.01        0
       5   DIFF PRES1   YES   OFF  N/A         0      1.01        0
       6   DIFF PRES2   YES   OFF  N/A         0      1.01        0
       7   FLOW RATE    YES   OFF  N/A         0  99999999        0
       8   VOL HIGH     YES   OFF  N/A         0  99999999        0
       9   SYS ERROR    YES   ON   NO     109999    120015        0

          F1: Update   F2: Change   F3: Transmit   F4: Exit
```

SFDAS requests the current status of all alarms configured in the unit. The current status of each configured alarm is displayed indicating whether the alarm is ENABLED or DISABLED. The STATUS column reflects the condition of the alarm and is not changed directly by the operator. If the alarm is enabled, the current status condition of the alarm is displayed, either ON or OFF. An alarm which is ON may or may not have been acknowledged, which is indicated in the ACKNOWLEDGED column by a YES or NO. The ENABLED and ACKNOWLEDGED status (only) can be changed, and the ACKNOWLEDGED status can be changed only when the alarm is ON. The LO column indicates the low alarm setpoint; the HI column indicates the high alarm setpoint; and the ALT column indicates the alternate setpoint. SolarFlow Plus Models 2460 and 2470 permit changes to all setpoint information. SolarFlow Plus Model 2480 permits changes only to the alternate setpoints.

Select function key F1 to update the alarm table. Select F2 to enable or disable alarms, acknowledge the alarms or change setpoint information. Select F3 to transmit the changes. The changes will be automatically updated on the screen. Press F4 to return to the main Direct Channel Access Mode menu. If F4 is pressed without transmitting your changes (F3), the changes will not be saved.

8.4.1 Enable/Disable Alarms

To change the status of the displayed alarms, Press F2: Change from the Alarm Mode menu. A screen such as the following example will be shown.

```
          SolarFlow Plus/2251 G.C.C. Data Acquisition System
               Direct Channel Access Mode - Alarm Mode

   NO.  NAME         ENAB? STAT ACKNOW   LO         HI        ALT
   1    BATTERY LO   YES   OFF  N/A      10.8       0         0
   2    METR PRES1   YES   OFF  N/A         0       1.01      0
   3    METR PRES2   YES   OFF  N/A         0       1.01      0
   4    METR TEMP    YES   OFF  N/A         0       1.01      0
   5    DIFF PRES1   YES   OFF  N/A         0       1.01      0
   6    DIFF PRES2   YES   OFF  N/A         0       1.01      0
   7    FLOW RATE    YES   OFF  N/A         0     99999999    0
   8    VOL HIGH     YES   OFF  N/A         0     99999999    0
   9    SYS ERROR    YES   ON   NO       109999     120015    0


          F1: Update   F2: Change   F3: Transmit   F4: Exit
```

From this screen, changes may be made as follows:

a. Move the cursor to the ENABLED column and alarm channel and press the HOME key to toggle between ENABLED and DISABLED. If the HOME key is toggled back to its original position, then the original status will be displayed again.

b. To enter changes for additional alarms, repeat this process.

c. Once the data is entered, press the END key.

In this manner, the changes for several alarms can be entered. All data changes are indicated by highlighted entries on the alarm screen. If you want your changes sent to the SolarFlow Plus, press F3. The changes will be automatically updated on the screen.

8.4.2 Acknowledging Alarms

From the Alarm Mode screen, alarms may be acknowledged by pressing F2: Change. The ACKNOWLEDGED column can be changed only when an alarm is active (ON). To acknowledge an alarm, move the cursor to the alarms ACKNOWLEDGED and press HOME. After the change(s), press END and F3: Transmit. The altered data is displayed by a highlighted entry until transmitted or the alarm data is updated from the SolarFlow Plus (F1: Update). The screen is automatically updated after a change is transmitted. If the data is not transmitted, exiting from this screen (F4) will clear changed data and return you to the main menu.

8.4.3 Changing Alarm Setpoint Values

From the Alarm Mode screen, alarm setpoint values may be altered by pressing F2: Change.

To change a setpoint, move the cursor to the alarm setpoint to be changed and press HOME. Enter the new value and press ENTER. To abort entry without changing the current value, press ESC instead of enter. The altered data is displayed by a highlighted entry until transmitted or the alarm data is updated from the SolarFlow Plus (F1: Update). The screen is automatically updated after a change is transmitted. Some restrictions exist with regards to changing setpoints with SolarFlow Plus Model 2480. With this model, only the ALTERNATE setpoint can be changed. Changes made to the HI and LO setpoints are transmitted, but do not affect the setpoint values in Model 2480.

8.5 CHANGE REMOTE TERMINAL UNIT (RTU) TIME/DATE

If you wish to change the date and time of a particular SolarFlow Plus unit, press F4: Change RTU Time at the main Direct Channel Access menu. An example of the Time Change Mode menu follows.

```
          Location: "Name"       Unit: "Name"
      Direct Channel Access Mode - Time Change Mode


            CURRENT SOLARFLOW PLUS TIME

                DATE:  11/05/89
                TIME:  12:04
         Day of week:  3

            NEW DATE/TIME SETTINGS

                DATE:  11/05/89
                TIME:  12:19
         Day of Week:  4


      F1: Change  F2: Transmit Change  F3: Exit
```

The currently stored date, time and day of week are displayed. To change the data, press F1: Change. Move the cursor keys to select an item, then press HOME to edit the item. Press END to indicate that the editing is complete. Press F2: Transmit Change to transmit the changed data. Press F3: Exit to exit to the main Direct Channel Access Mode menu. If you press F3 without transmitting your changes (F2), your changes will not be saved.

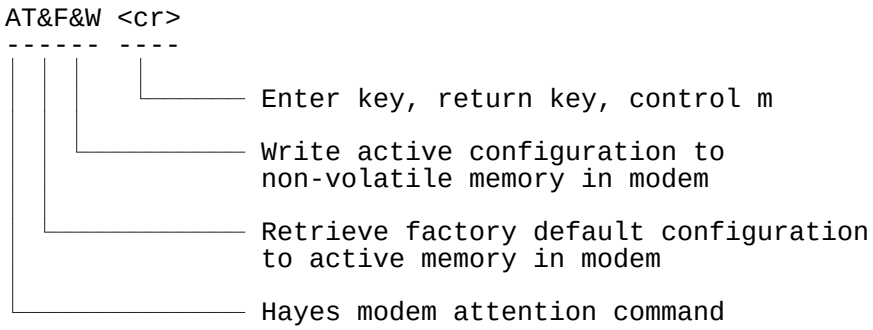
APPENDIX A

HAYES 2400 AND 2400B MODEM SETTINGS FOR SFDAS PROGRAM

A.1.0 The default configurations of the Hayes 2400 and 2400B modems are stored in a non-volatile memory. When these modems are used with the SFDAS program, the modems should be in the factory default configuration. If the modem's non-volatile configuration has been modified then it will need to be set back to the factory default. The SFDAS program resets the modem to the configuration in non-volatile memory when it initiates a call to a unit. Either a communications package (such as PROCOMM, XTALK, BITCOM, ETC.) or a resident DOS program may be used to set the factory default configuration in the non-volatile memory of the modem. The commands to reset the modem to factory default configuration are detailed as follows:

A.1.1 Method Using Communications Package

a. Send the command: AT&F&W <cr> from within the communications package to the Hayes 2400 or 2400B Modem through the appropriate communications port (COM1 or COM2).



A.1.3 Method Using DOS to set-up modem

a. Using DOS to set-up the modem requires several steps to create; but with a Batch file it can be executed very easily.

b. To set the baud rate of the communications port connected to the modem, make sure that the program "MODE.COM" is accessible on one of the disks in the computer. This program sets the baud rate of the communications port connected to the modem. Write a small document file using DOS commands that will be sent to the modem. Follow the example below:

C:\>copy con HAYES <enter>

AT&F&W <enter>

<F6 or control z (^z)>

This file will reside in the root directory of the drive C or it could be created on another disk drive in place of C.

c. Whenever these modems are to be used with SFDAS the following sequence should be used:

C:\>DOS\MODE COM2: 2400,n,8,1 <enter>

COM2: 2400,n,8,1,-

C:\copy HAYES COM2: <enter>
1 file(s) copied

The modem has now been configured properly for operation with SFDAS.

d. A batch file can be created to perform all of the routine functions described previously with the following commands:

```
C:\copy con SFDAS.BAT <enter>
C:\DOS\MODE COM2: 2400,n,8,1
copy C:\Hayes COM2:
cd\SFDAS
SFDAS
<F6 or control z (^z)>
```

This batch file can be executed by typing "SFDAS" at the DOS prompt. Several items might change depending on the computer being used. The preceding example assumes that there is no path declared, the default drive at the DOS prompt is C, communications port 2 (COM2) is connected to the modem, the SFDAS program has been transferred from the master diskette to a sub-directory named "SFDAS", and that file "MODE.COM" is located in a sub-directory named "DOS".

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APPENDIX B

HAYES 1200 MODEM SETTINGS FOR SFDAS PROGRAM

SW1	Down	DTR status detection	Modem ignores DTR status
SW2	Up	Result code mode	Verbal result codes
SW3	Down	Result code display	Result code enabled
SW4	Up	Command echo	Characters echoed in command state
SW5	Down	Auto-answer on/off	Auto-answer disabled
SW6	Down	Carrier status detection	Carrier detect and DSR always on
SW7	Up	Telephone jack type selection	RJ-11, RJ-41S, RJ-45S
SW8	Down	Command recognition	Enabled
SW9	Up	Bell/ccitt protocol selection	Bell
SW10	Up	Modem reset	Modem returns to command state on DTR on-to-off transition

NOTE: The above switch settings are the factory default settings from Hayes.

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WARRANTY CLAIM REQUIREMENTS

To make a warranty claim, you, the Purchaser, must:

1. Provide Daniel with proof of the Date of Purchase and proof of the Date of Shipment of the product in question.

2. Return the product to Daniel within twelve (12) months of the date of original shipment of the product, or within eighteen (18) months of the date of original shipment of the product to destinations outside of the United States. The Purchaser must prepay any shipping charges. In addition, the Purchaser is responsible for insuring any product shipped for return, and assumes the risk of loss of the product during shipment.

3. To obtain Warranty service or to locate the nearest Daniel office, sales, or service center call (281) 897-2900, Fax (281) 897-2901, or contact:

   Daniel Measurement Services
   19203 Hempstead Highway
   Houston, Texas 77065

   When contacting Daniel for product service, the purchaser is asked to provide information as indicated on the following "Customer Problem Report".

   Daniel Measurement Services offers both on call and contract maintenance service designed to afford single source responsibility for all its products.

   Daniel Industries, Inc. reserves the right to make changes at any time to any product to improve its design and to insure the best available product.

DANIEL INDUSTRIES, INC.
CUSTOMER PROBLEM REPORT

FOR FASTEST SERVICE, COMPLETE THIS FORM, AND RETURN IT ALONG WITH THE AFFECTED EQUIPMENT TO CUSTOMER SERVICE AT THE ADDRESS INDICATED BELOW.

COMPANY NAME:_____

TECHNICAL CONTACT:_____ PHONE:_____

REPAIR P. O. #:_____ IF WARRANTY, UNIT S/N: _____

INVOICE ADDRESS:_____

_____

_____

SHIPPING ADDRESS:_____

_____

_____

RETURN SHIPPING METHOD:_____

EQUIPMENT MODEL #:_____ S/N:_____FAILURE DATE: _____

DESCRIPTION OF PROBLEM: _____

_____

_____

WHAT WAS HAPPENING AT TIME OF FAILURE? _____

_____

ADDITIONAL COMMENTS: _____

_____

_____

REPORT PREPARED BY:_____ TITLE:_____

IF YOU REQUIRE TECHNICAL ASSISTANCE, PLEASE FAX OR WRITE THE MAIN CUSTOMER SERVICE DEPARTMENT AT:

DANIEL MEASUREMENT SERVICES
ATTN: CUSTOMER SERVICE
19203 HEMPSTEAD HIGHWAY
HOUSTON, TEXAS 77065

PHONE: (281) 897-2900
FAX: (281) 897-2901

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