OPW
FUEL MANAGEMENT SYSTEMS

System2®

U.S. Postal Service Version

Operator's Manual

FSC Software Version S041440.1A

The material in this manual is subject to engineering changes and editorial revisions

 Manual No. **M041-44.01A**

OPW Fuel Management Systems -
System and Replacement Parts Warranty Statement

Effective September 1, 2002

System and Replacement Parts Warranty

OPW Fuel Management Systems warrants that all OPW Tank Gauge and Petro Vend Fuel Control systems supplied by OPW Fuel Management Systems to the Original Purchaser will be free from defects in material and/or workmanship under normal use and service for a period of 12 months from the date of installation or 15 months from the date of shipment. Additionally, OPW Fuel Management Systems warrants that all upgrades and replacement parts (new and remanufactured) supplied by OPW Fuel Management Systems will be free from defects in material and workmanship under normal use and service for a period of 90 days from the date of installation or for the remainder of the system's original warranty, whichever is greater, as set forth in the first sentence of this statement. The foregoing warranties will not extend to goods subjected to misuse, neglect, accident, or improper installation or maintenance or which have been altered or repaired by anyone other than OPW Fuel Management Systems or its authorized representative.

The buyer's acceptance of delivery of the goods constitutes acceptance of the foregoing warranties and remedies, and all conditions and limitations thereof.

If a claim is made within the warranted time period that any equipment and/or remanufactured part is defective in material or workmanship under normal use and service, such equipment and/or remanufactured part shall be returned to OPW Fuel Management Systems, freight prepaid. If such equipment or remanufactured part is found by OPW Fuel Management Systems in its sole judgment, to be defective in material or workmanship under normal use and service, OPW Fuel Management Systems, shall, at its sole option, repair or replace such equipment and/or remanufactured part (excluding, in all instances, fuses, ink cartridges, batteries, other consumable items, etc.)

The warranties, as set forth above, are made expressly in lieu of all other warranties, either expressed or implied, including, without limitation, warranties of merchantability and fitness for any particular purpose and of all other obligations or liabilities on OPW Fuel Management Systems part. Further, OPW Fuel Management Systems neither assumes, nor authorizes any other person to assume for it, any other liability in connection with the sale of the systems, or any new/replacement part that has been subject to any damage from any act of nature or any *force majeure*.

The term "Original Purchaser" as used in these warranties shall be deemed to mean the authorized OPW Fuel Management Systems distributor to which the system or any new/replacement part was originally sold. These warranties may be assigned by the original purchaser to any of its customers who purchase any OPW Fuel Management Systems systems or new/replacement parts.

The sole liability of OPW Fuel Management Systems, for any breach of warranty, shall be as set forth above. OPW Fuel Management Systems does not warrant against damage caused by accident, abuse, faulty or improper installation or operation. In no event shall manufacturer's liability on any claim for damages arising out of the manufacture, sale, delivery or use of the goods exceed the original purchase price of the goods. In no event shall OPW Fuel Management Systems be liable for any direct, indirect, incidental or consequential damage or loss of product.

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Part I - Introduction

1.0 Features

Fleet operators and petroleum distributors now have a fueling system to match their business needs: the Petro Vend SYSTEM2, a flexible, powerful tool for fuel management that is easy to program and even easier to use. The **SYSTEM2** gives you security, accountability and control.

Features of your new SYSTEM2 include:

☐ **Superior Fuel Site Control**

Your system can track an extensive list of card record parameters and transaction data.

☐ **Multiple Card Formats**

The Fuel Island Terminal (FIT) is the customer interface containing the card readers, a keypad, and a display screen. in your **SYSTEM2** can be equipped to handle magnetic stripe cards, optical cards, and Petro Vend ChipKeys™.

☐ **Maximum Configuration Flexibility**

One Fuel Site Controller (FSC), the small desktop control box, can control up to four FITs, giving you the power to control up to 32 fueling positions in mechanical pumps. The FSC can also handle electronic and alternative fuel dispensers.

☐ **Commercial Fueling Network Compatibility**

The **SYSTEM2** can accept commercial fueling cards, truck fleet cards, oil company cards and major bankcards.

☐ **Large Memory Capacity**

Four memory levels are available for your system, handling up to 16 million cards.

☐ **Menu-driven Programming**

Step-by-step menus guide you through most system functions.

☐ **Runs existing K2500 software**

☐ **On-site or remote access**

☐ **Automatic daily pump totals**

☐ **On-demand Pump, Product and Shift Totals**

☐ **Tank Inventory Levels with Low Level alert**

☐ **Sixteen Product or Quantity Restriction levels**

☐ **Cardless (keypad entry) operation allowed**

☐ **Single or Dual Card/Key Operation (Driver/Vehicle)**

☐ **Programmable customer messages and receipts**

☐ **Card or Key Lockout**

☐ **Programmable Open/Close system times**

☐ **Three password options**

☐ **Self-test and diagnostic functions.**

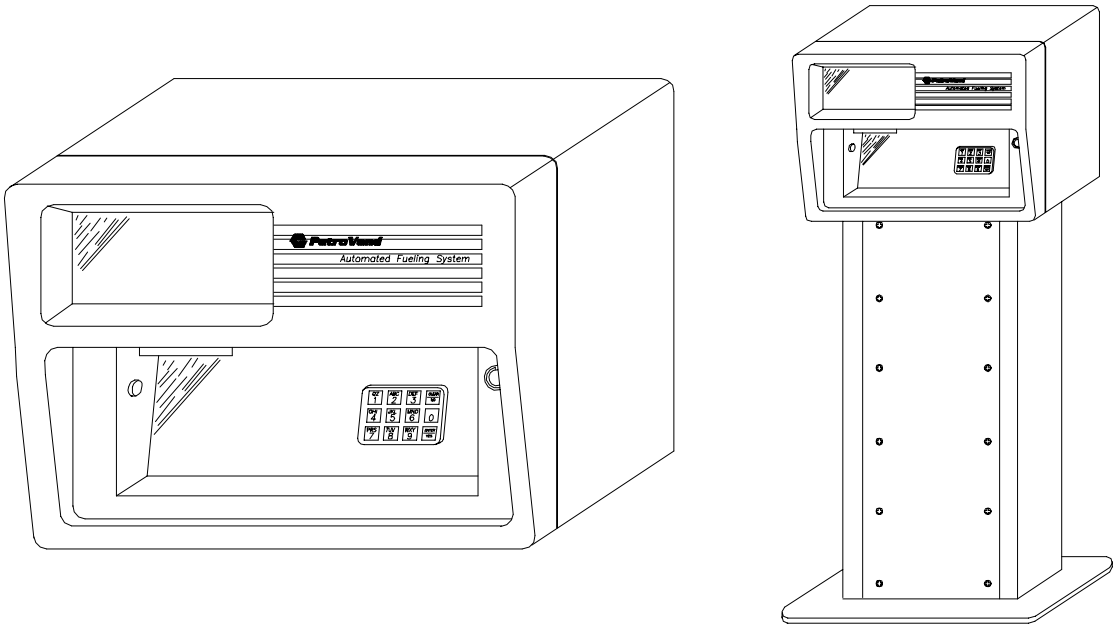
More information on these features is located in various parts of this manual.

2.0 Equipment Overview

An installation consists of FITs (Fuel Island Terminals), PCTs (Pump Control Terminals), and an FSC (Fuel Site Controller). Section 2.1 describes the pedestal-mounted FIT. Section 2.2 covers the Pump Control Terminal (PCT). Section 2.3 explains the Fuel Site Controller (FSC).

2.1 Fuel Island Terminal (FIT)

The FIT contains the keypad (for user entries of data), one or two card readers, and the receipt printer. The FIT gathers information from the pumps, and sends it to the FSC.



Up to four FITs can be installed per site. The FIT has a display for prompting customers through the fueling process, a keypad for data entry, and one or two card or key readers.

2.1.1 Installation

Each FIT connects to the Fuel Site Controller using twisted pair wires and rigid steel conduit. The FSC manages the FIT(s) and the peripheral devices.

The FIT(s) must be installed as shown in the *System 2 Installation Manual*. The installation manual also details the FIT board and descriptions of its status LEDs and programming switches.

2.1.2 Card or Key Readers

Cards or keys can access **SYSTEM2**. The FIT can have one or two readers for magnetic stripe cards, optical cards, or ChipKeys.

2.1.3 Display

Three types of display are available:

- Single-row of characters
- Double row of characters
- Graphics display

.See the *Customer Messages Menu* section of this book for more details.

2.1.4 Printer Option

An optional receipt printer can be installed in the FIT to provide transaction information to the customer. Like the display, the data and format of the receipt are programmable.

2.1.5 Keypad Operation

[1] - **[0]** - Use the ten number keys to enter PIN numbers, pump numbers, odometer entries and miscellaneous information. As a memory aid, the data keys are labeled as on a telephone. For example, a fueler with the PIN "3733" could remember this as "FRED" by associating each number with a letter from the data key.

[ENTER/YES] - This key has two functions: as an ENTER key, it sends your keyboard entry to the system. Its other function is to answer YES to a YES/NO? prompt.

[CLEAR/NO] - This key, also dual-purpose, either clears a displayed entry or answers NO to a YES/NO? prompt.

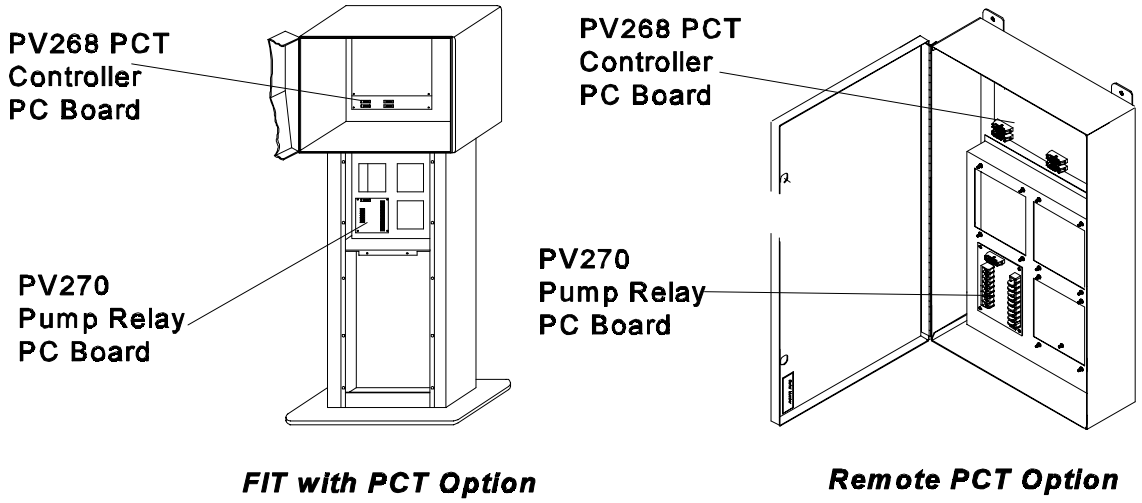
[EMERG STOP] - Press the Emergency Stop button to immediately stop the fuel pumps. You can program which PCTs are affected by the Emergency Stop button on each FIT. SYSTEM2 returns to normal operation when the next card or key is inserted.

2.1.6 FIT Specifications

Dimensions	***Cabinet*** 15" H x 18" W x 11" D (38 x 46 x 28 cm) ***Pedestal:*** 48" H x 14" W x 8" D (122 x 36 x 20 cm)
Power Requirements	110-120 VAC, 50/60 Hz, 200 W max 220-240 VAC, 50/60 Hz, 200 W max
Operating Temperature Range	-40°F to +122°F (-40°C to +50°C) *Heater required for FIT operation below freezing point (32°F or 0°C)*
Display Options	Standard: 2-row x 16-character fluorescent Option 1: 1-row x 40-character fluorescent Option 2: 64,000 pixel (200 x 320) LCD screen
Reader Options	Magnetic Stripe Reader ("Swipe" or motorized) Optical Reader ChipKey™

2.2 Pump Control Terminal (PCT)

The PCT gathers the data from the actual pumps and formats it for the FSC. The PCT can either be built in to the FIT - as a PC board located behind the FIT PC board, or in a separate indoor cabinet. See Figure below.



Up to four PCTs can be installed. There are two types of PCT installation (see the illustration above).

- The PCT circuit board is located in the FIT cabinet and the pump control relays are mounted in the FIT pedestal
- The PCT board and pump control relays are placed in a separate, indoor cabinet.

Both types of installation provide the following:

- Easy access to pump control relays
- Active and passive pulser support
- Electronic and mechanical pulser support
- Pulser activation by current flow or handle activation.

With optional ***Universal Pump Control*** (UPC) software, the FSC can authorize fueling transactions via a pump control console (such as used in a self service station).

For pumps controlled by a UPC, refer to the UPC Operator Guide.

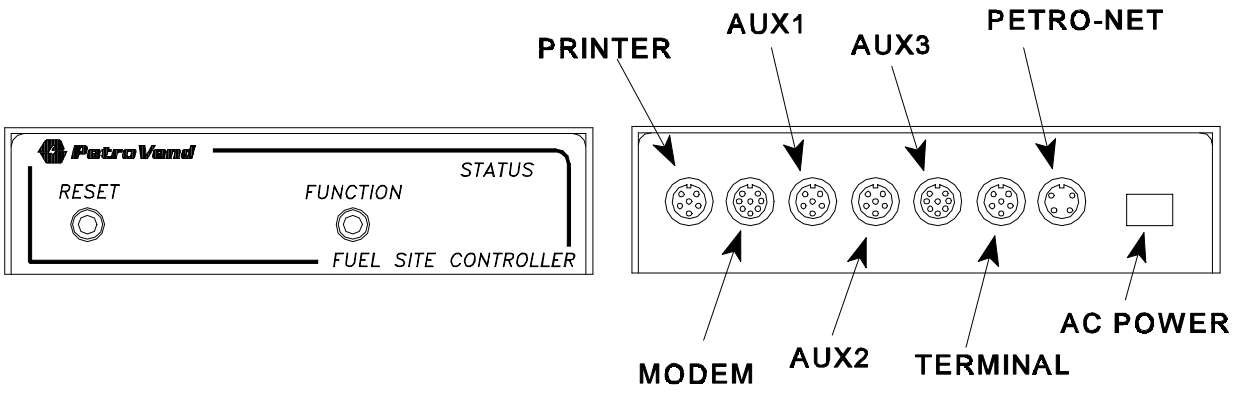
PCT specifications are on the following page.

PCT Specifications

Dimensions (indoor cabinet style)	25" H x 16" W x 5" D (64 x 41 x 13 cm)	
Power Requirements (indoor cabinet style)	110-120 VAC, 50/60 Hz, 100 W max 220-240 VAC, 50/60 Hz, 100 W max	
Operating Temperature Range (indoor cabinet style)	32°F to +122°F (0°C to +50°C)	
Pump Rating	3/4 HP, 120/240 VAC	
Pulser	**COMPATIBILITY**	Contact/12VDC electronic, 40 Ma max per pulser
	RATE RATIO	1:1 to 1000:1 in 1-pulse increments
	SPEED	6,000 pulses per second (mechanical type), 100,000 pulses per second (electronic type)
	DUTY CYCLE	50%

2.3 Fuel Site Controller (FSC)

The FSC processes data supplied over Petro-Net from the PCTs and FITs. The FSC also contains all card information and system configuration data.



The FSC manages the operations of the FIT(s), the .ASCII terminal or computer, the journal printer, and the optional modem.

2.3.1 Installation Overview

The FSC must be installed indoors, and connected to one of the FITs using twisted pair wiring and rigid steel conduit.

Install the FSC as described in the System2 Installation Manual. That manual also contains an illustration of the FSC board and descriptions of its status LEDs and switches.

2.3.2 External Computer Connections

To communicate with the system, the FSC must be connected to one of the following:

- A standard ASCII terminal
- An IBM® or compatible computer
- Any computer capable of ASCII communications.

If not using an ASCII terminal, the PC or mainframe computer must be running an emulation program to simulate the operations of an ASCII terminal. For terminal baud rate, see the table on the following page, or the *System2 Installation Manual*.

2.3.3 Journal Printer

The journal printer is connected to the FSC PTR port to generate hard copy of transaction data.

2.3.4 Modem Use

For remote operation, the FSC connects to an optional modem to provide complete control from a remote terminal or computer over standard telephone lines. Refer to Appendix C for details on modem operation

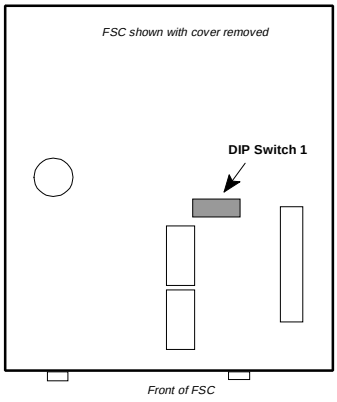
The table opposite shows you how to set the baud rate for the MODEM port.

FSC DIP SWITCH #1: Terminal and Modem Port Baud Rate		
Baud Rate	**Position 6**	**Position 7**
300	OPEN	OPEN
1200	OPEN	CLOSED
2400	CLOSED	OPEN
9600	CLOSED	CLOSED

2.3.5 Battery Backup

The FSC has a built-in battery to protect its data in case of an interruption or loss of AC power. The battery can be disconnected when a total clearing of data is required.

DIP Switch 1 Location



2.3.6 FSC Specifications

Dimensions	2" H x 10" W x 11" D (5 x 25 x 28 cm)
Power Requirements	110-120 VAC, 50/60 Hz (220-240 VAC, 50/60 Hz) 50W max
Operating Temperature Range	32°F to +122°F (0°C to +50°C)
Rear Port Protocols	PN (Petro-Net): RS-485 CAP (Terminal): Proprietary protocol MODEM (Modem): RS-232 AUX 1-3 (Auxiliary Inputs): RS-232
Front Panel Controls & Indicators	RESET button Press to "warm-start" system (retains config. data) FUNCTION button Use with RESET button to "cold-start" system STATUS display The number of devices the FSC is currently communicating with.

3.0 Operational Overview

Upon initial power-up, the first menu to appear is the *non*-privileged Main menu. To enter privileged mode, either type HELLO at the ">" prompt, then enter the privileged password, OR use the MENU option in the SYSTEM PARAMETERS menu.

Section 5 (Page 12) is a practice session, giving you a chance to use most of the system features in a simulated site setup.

All commands to operate **SYSTEM2** can be reached via the menus; "regular" commands can be entered at the ">" prompt, if desired - use the MENUS option in the SYSTEM PARAMETERS menu to turn menus OFF (or ON).

3.1 MAIN MENU

The first menu that appears after power is applied to SYSTEM2 is the Main menu (see Page 23).

All system functions are accessed from the Main menu: System Access, System Times, System Devices, Customer Messages, System Parameters, Restrictions, Cards/Accounts, Transaction Data, System Totals, and Journal Printer. Each is briefly described below; for a full description, turn to the indicated page.

A "Main Menu Outline" of all submenus accessed from the main menu is on Page 12.

3.2 SYSTEM ACCESS MENU

See Page 25. Use this menu to open or close the system, to open a connection to a modem, to change passwords, or to use the "passthru" feature to communicate with other Petro-Vend products.

There are three methods of operation for **SYSTEM2**: (1) normal, (2) restricted and (3) privileged.

Normal - The normal mode is the default mode. This mode does *not* have to be enabled. No password is required. In this mode, you can print and display all system, card/key, account, and transaction data.

Restricted - To safeguard **SYSTEM2** data from unauthorized viewing, you may enable the restricted mode. When this mode is enabled, the "show" password must be entered before any information can be displayed or printed and before the privileged mode can be accessed.

When the restricted mode is enabled, no commands will be accepted and no characters will be echoed to the screen until the show password is entered.

IMPORTANT

Only the normal or the restricted mode may be enabled at one time. When the `$' prompt displays, the restricted mode is enabled and the show password must be entered to proceed.

Privileged - To configure **SYSTEM2**, the system must be in the privileged mode. To prevent unauthorized tampering with the system, a password is required.

To access the privileged mode, select **SYSTEM ACCESS** from the MAIN MENU. From SYSTEM ACCESS MENU, select **HELLO** and enter the main password (factory default is "HELLO").. To exit privileged mode, enter **BYE**.

The system automatically exits from privileged mode if no keyboard entry is made for 10 minutes.

The **`DOWNLOAD'** command must be entered after all **`CONFIGURE'** and **`FORMAT'** commands. Until the **`DOWNLOAD'** command is entered, does *not* recognize these changes. When entering several downloadable commands, you do *not* have to enter the **`DOWNLOAD'** command until after the last command.

To access the system using a PC and/or a modem, refer to Appendix D.

3.3 SYSTEM TIMES MENU

See Page 27. Use the System Times menu set the following:

- Real time and date
- Date on which to change to (and from) daylight savings time
- When to turn the system ON and OFF
- When to turn the pocket lights ON and OFF.

3.4 SYSTEM DEVICES MENU

See Page 29. This menu lets you program the following:

- The FITs
- The PCTs
- The optional UPC (Universal Pump Controller)-equipped PCT.

3.4.1 FIT Programming Overview

The FIT controls the card/key reader(s), keyboard, display and optional /receipt printer. The following features can be programmed for each FIT:

- Whether to issue transaction receipts
- The time limit for issuing receipts
- Whether to allow keyboard entry of data
- Which PCTs to shut off when the Emergency Stop button is pressed
- If the card reader error counter should be reset
- Which pumps should be activated.

3.4.2 PCT Programming Overview

The Pump Control Terminal boards are either in the FIT pedestal or in a separate cabinet. Each PCT board controls the following parameters for up to eight pumps:

- Pump Number
- Pump Status
- Product Name
- Tank Number
- Quantity Restriction
- Total Time for Fueling
- Maximum Time for Pump Handle
- Maximum Time for First Pulse
- Maximum Time for MPD
- Pulser Divide Rate
- Pump Sentry feature

3.4.3 UPC Programming Overview

The UPC can emulate up to four PCTs for operation with a self-service console.

The UPC option enables **SYSTEM2** to connect to a site console and provide *simultaneous* unattended *and* self service fueling.

For complete details on UPC operation, refer to the UPC *Operator Guide*.

3.5 CUSTOMER MESSAGES MENU

See Page 34. This menu lets you:

- Define receipt format and bonus points
- Display prompts and keyboard responses
- Create individual messages for fuelers
- Specify a date/time format

3.6 SYSTEM PARAMETERS MENU

See Page 49. This menu lets you:

- Display a system status report
- Set a site ID
- Specify fuel units, prices, and names
- Define product measuring "labels"
- Create new passwords
- Enable or disable the dual language feature
- Enable or disable the menus
- Enable or disable the response echo
- Specify a coupon value ("bonus points")
- Define the system memory size
- Display the software version
- Show the condition of the battery backup.

3.7 RESTRICTIONS MENU

See Page 54, 57. This menu sets up the following:

- Odometer Reasonability
- Pump Restrictions
- Quantity Restrictions
- Security Table

3.8 CARDS MENU

See Page 58. SYSTEM2 is activated via magnetic cards, optical cards, or programmable ChipKeys, depending on the reader supplied with your system.

Each card or key used has its own “bit” in the SYSTEM2 database. This bit is set to “1" for valid cards, or to “0" for invalid cards.

The **SYSTEM2** can use single or dual card (or key) operation. Three distinct types of card or key are recognized:

- Single
- Driver
- Vehicle

3.9 TRANSACTION DATA MENU

See Page 61. Use this menu to program the following information for each transaction:

- Driver and vehicle card/key numbers
- Transaction and pump numbers
- Product type, quantity and price
- Keypad entries (for odometer entries and miscellaneous data).

3.10 SYSTEM TOTALS MENU

See Page 64. All completed **SYSTEM2** transactions can be either printed or displayed. Using the System Totals menu you can restrict the transactions you want to see by the following parameters:

- Date
- Time
- Transaction, card, account, or vehicle number
- Pump
- Fueltype
- Day, shift, or midnight.

3.11 JOURNAL PRINTER MENU

See Page 67. The journal printer must be set before it can print **SYSTEM2** data. You can temporarily block the transaction logging function to prevent transactions from being interspersed throughout a printout.

3.12 MAIN MENU OUTLINE

A. System Access

a. Open
b. Close
c. Call
d. Hello
e. Bye
f. Passthru

B. System Times *(show/print/set)*

a. Time
b. Time Change
c. Date
d. System ON Time

C. System Devices *(show/ print/ install/configure a-e below)*

a. FIT
b. PCT
c. PCT & Position
d. Pump
e. Program
f. Set Pump ON
g. FIT Download
h. PCT Download

D. Customer Messages *(show/ print/ format)*

a. Receipt Body
b. Receipt Header
c. Receipt Trailer
d. Receipt Bonus Points
e. Display Number
f. Keyboard Number
g. Messages
h. Date

E. System Parameters *(show/print/set)*

a. System (show only)
   - *Current Time/Date*
   - *Installed FITs and PCTs*
   - *Low Tanks*
   - *Power failure times*
b. Site ID
c. Fuel Type Assignments
d. Fueling Units
e. Password
f. Language (dual ON/OFF)
g. Bypass (kbd, odom, misc, PIN)
h. Menu (ON or OFF)
i. Echo (ON or OFF)
j. Bonus Points
k. RAM (memory level 0-4)
l. Version (software version)

F. Restrictions *(show/ print/ set)*

a. Pump Restriction (code 0-15)
b. Quantity Restriction (code 0-15)
c. Security (row 1/2)

G. Cards *(show/print/set)*

a. Card

1. Card Transaction Buffer Size
2. Keyboard Entry Options
3. Keyboard Access Type
4. Keyboard Card Control Data

b. Validate Card
c. Invalidate Card

H. Transaction Data *(show/print/ set/ clear)*

a. Transaction by date/time/card/ account/vehicle (show or print)
b. Summary of "a" above (show/ print)
c. Transaction by number (show/ print)
d. Transaction Set or Clear
e. Clear Transaction by date/sequence

I. System Totals *(show/ print/ set/ clear)*

a. Transaction by date/time/card/ account/vehicle (show or print)
b. Summary of "a" above (show/ print)
c. Midnight (show or print, eight days)
d. Day (show or print, current day)
e. Shift (show/print, change shift)
f. Pump Totals (show, print, or clear)
g. PCT Totals (show, print, or clear)
h. Fuel Type Totals (show or print)
i. Tank Totals (show, print, or set)

J. Journal Printer

a. Set, Show, Print Printer Configuration
b. Lock or Unlock Printer

4.0 Getting Started

4.1 OVERVIEW

This section tells you how to configure the System2, some basic operational tips and a sample transaction printout.This session assumes your system is completely installed, and that the hardware has passed all self-diagnostics.

The references made in each step are to other sections of this manual where you can find complete details on the function used.

4.2 HOW TO ISSUE COMMANDS

You can issue commands to the system in one of two ways:

- Via menus (takes longer, but the related functions of the system are easier to understand)
- Via direct typed commands.

For example, to define how much RAM is in your system, you can type the **SET RAM** command at the **P>** prompt, OR you can access the System Parameters menu from the Main Menu, and then select Set RAM.

This manual is organized around the menus that are built into the system software. All menus "branch out" from a Main menu; the Main menu is displayed after you power up the FSC and terminal, and press the **[ENTER]** key several times. For a menu overview, see Page 12.

Turn the menus ON or OFF by typing **SET MENU** (and pressing **[ENTER]**) at the **P>** prompt. Answer **Y** or **N** at the **ENABLE MENUS?** prompt as desired.

4.3 CONFIGURATION

Use the *System2 Installation Manual* to connect components of the system. After connecting the terminal, and optional modem or printer, do the following.

1. Power up your terminal. Apply power to all components of the System2. The STATUS display on the front of the FSC "cycles" for a few seconds while a self-test is done.

2. Press the **[ENTER]** key several times on the terminal until you see a **>** prompt. Type the word **HELLO**, then press **[ENTER]**. You will see the following prompt:

```
ENTER MAIN PASSWORD:
```

3. The default password is HELLO. Type **HELLO** and press **[ENTER]** to enter privileged mode. The prompt changes to:

```
P>
```

4. Set the current date and time using the **SET DATE** and **SET TIME** commands (see Page 27). A typical time and date setup would go as follows:

```
P> SET DATE [ENTER]

ENTER DATE (MMM DD, YYYY): JUN 10,1994 [ENTER]

JUN 10,1994  12:49 AM

P> SET TIME [ENTER]

ENTER TIME (XX:XX AM/PM): 11:00 [ENTER]

JUN 10,1994   11:00 AM

P>
```

5. Set up your journal printer (see Page 67):

```
P> SET JOURNAL [ENTER]

OFFICE JOURNAL (Y/N)? y [ENTER]

SET JOURNAL HEADER (Y/N)? y [ENTER]
|                        |
--> This is a test header|

JOURNAL ERROR OPTION (Y/N)? y [ENTER]

 --ENABLE AUTH ON JOURNAL ERROR (Y/N)? n [ENTER]
```

After about 15 seconds the system will print a test header:

```
This is a test header !  * * * * *
MOTOR FUEL MANAGEMENT SYSTEM BY PETRO VEND INC. HODGKINS, IL
T# DAY TIME S OPER# CARD# VEHICLE# MSTR VEH# ML/FNC TRAN PUMP PROD QUANTITY
```

6. Confirm that your system is set up properly. Use the **SHOW SYSTEM** command (see Page 49):

```
P> SHOW SYSTEM [ENTER]

SYSTEM 2: BITMAP VERSION #: 44.01
EPROM CHK: 97EE
DISPLAY: 2x16     PPU: PROGRAMMABLE

JUN 10,1994   11:03 AM   SYSTEM ON     BATTERY OK
INSTALLED FITs:
   1: STATUS --running

INSTALLED PCTs:
   (std) PCT 1, POSITIONS:  1, 2, 3, 4, 5, 6, 7, 8
STATUS --running

LOW TANKS:
POWER FAIL TIMES:
   JAN 01,1990   12:00 AM
   JAN 01,1990   12:00 AM
P>
```

7. Confirm that the PCT and pumps are installed properly with the **SHOW PCT** command (see Page 29):

```
P> SHOW PCT 1 [ENTER]

PCT 1 POSITION 1   PUMP #1
PULSES PER GALLON: 10
ABSOLUTE MAX QUANTITY: 10 GALLON
PUMP INACTIVE
PUMP SENTRY: DISABLED

*** PUMP TIME-OUTS ***
TOTAL FUELING TIME-OUT (min): 5
PUMP HANDLE TIME-OUT (sec)  : 240
FIRST PULSE TIME-OUT (sec)  : 240
MISSING PULSE TIME-OUT (sec): 60

FUELTYPE CODE     TANK #     TOTALS        TOTALIZER
1:  NOLEAD GAS      1        0.0           0.0
```

You can check settings for each pump individually:

```
PUMP         1   2   3   4   5   6   7   8
PCT  #       1   1   1   1   1   1   1   1
POSITION     1   2   3   4   5   6   7   8
PULSES      10  10  10  10  10  10  10 100
TIME-OUT   240 240 240 240 240 240 240 240
MP T/O      60  60  60  60  60  60  60  60
FUELTYPE     1   2   3   4   5   6   7   8
```

8. Show current fueltypes with the **SHOW FUELTYPE** command *(change* them in Step 9 below; see Page 49):

```
P> SHOW FUELTYPE [ENTER]

            0: MOTOR OIL        --PRICE PER GALLON: 1.000
            1: NOLEAD GAS       --PRICE PER GALLON: 1.000
            2: DIESEL FL.       --PRICE PER GALLON: 1.000
            3: TRANS OIL        --PRICE PER GALLON: 1.000
            4: COOLANT          --PRICE PER GALLON: 1.000
            5: VEHCL WASH       --PRICE PER GALLON: 1.000
            6: LUB.GREASE       --PRICE PER GALLON: 1.000
            7: COMPRS GAS       --PRICE PER GALLON: 1.000
            8: PROPANE          --PRICE PER GALLON: 1.000
            9: LPG              --PRICE PER GALLON: 1.000
            10: LUBE OIL1       --PRICE PER GALLON: 1.000
            11: LUBE OIL2       --PRICE PER GALLON: 1.000
            12: TRANS OIL       --PRICE PER GALLON: 1.000
            13: COOLANT         --PRICE PER GALLON: 1.000
            14: WATER           --PRICE PER GALLON: 1.000
            15: AIR             --PRICE PER GALLON: 1.000
  P>
```

9. To change the price for any fuel:

```
P> SET FUELTYPES 1 [ENTER]

              1: NOLEAD GAS          --PRICE PER GALLON: 1.000
                 FUELING UNIT CODES:
                  1: GALLON
                  2: LITER
                  3: QUART
       ENTER FUELING UNIT CODE (1-3): 1 [ENTER]
       CHANGE PRICE (Y/N)? y [ENTER]
       ENTER PRICE PER GALLON: 2.89 [ENTER]
       CHANGE PRODUCT NAME (Y/N)? N [ENTER]

P> SH FUELTYPES 1 [ENTER]
              1: NOLEAD GAS          --PRICE PER GALLON: 2.890
    P>
```

10. Display quantity restrictions with the **SHOW QUANTITY** command (abbreviated as shown below; see Page 54).

```
P> SH QU [ENTER]
        QUANTITY RESTRICTION CODES:

             CODE 1: 00012
             CODE 2: 00022
             CODE 3: 00032
             CODE 4: 00042
             CODE 5: 00052
             CODE 6: 00077
             CODE 7: 00102
             CODE 8: 00152
             CODE 9: 00202

P>
```

11. Leave privileged mode:

```
P> BYE [ENTER]

       BYE!
     >
```

Complete setup instructions for other aspects of System2 are in the Operator's Guide.

4.4 BASIC OPERATION

A typical transaction happens like this:

1. The prompt **ENTER OPERATOR NO** is the "standby" message displayed on the FIT. A customer enters their Operator Number, a number from 1-19999. The **[ENTER]** key is pressed.

2. After entering an Operator Number, the system prompts you for a **SECURITY NUMBER**. This is a "PIN" number from 0001 to 9999. Enter your Security Number and press **[ENTER]**.

3. The third prompt is **INSERT CARD**. Insert your card or key in the reader; the next prompt is **REMOVE YOUR CARD**.

   The card or key must be removed for the system to operate!

4. Next is the **FINANCE #** request - enter up to a six-digit number, and press **[ENTER]**.

5. Next is the prompt **ENTER VEHICLE #**. Enter a minimum seven-digit number and press **[ENTER]**.

6. Next is the prompt **SELECT PUMP #**. Enter a number from 1 to 16, and press **[ENTER]**.*

7. Pump the fuel. When fueling is complete and the pump is shut off, the **ENTER OPERATOR NO** prompt reappears.

** If you enter a Pump Number from 13-16, manual entry is permitted. To try manual entry, repeat all steps above, except at the **ENTER PUMP #** prompt enter **13**. The next prompt is **ENTER QUANTITY**. Enter up to 5 digits and a press of [ENTER]. The final prompt: **ENTER COMPLETE**.*

4.5 SAMPLE TRANSACTION

```
This is a test header ! * * * * *
MOTOR FUEL MANAGEMENT SYSTEM BY PETRO VEND INC. HODGKINS, IL
T# DAY TIME  S OPER# CARD# VEHICLE# MSTR VEH# ML/FNC TRAN PUMP PROD QUANTITY
T0 169 12:12 1 00001 12001 123456789 ????????? 031668 0001  01   01  00007.50
T3 169 12:18 1 00001 15001 000000000 078451236 665522 0002  02   02  00012.00
T6 169 12:21 1 00001 12001 123456789 ????????? 031668 0003  13   00  00005.00
```

The abbreviations in the sample printout are:

T#	Reason for Termination (*see below*)
DAY	Day (of the year)
TIME	24-hour time
S	Reader Station Number
OPER#	Operator Number
CARD#	Card Number
VEHICLE#	Vehicle Number
MSTR VEH#	Master/Vehicle Number
FNC	Finance Number
TRAN	Sequential Transaction Number
PUMP	Pump Number
PROD	Product Number
QUANTITY	Quantity Dispensed

The **T#** (Reason For Termination) codes are as follows (see the *Troubleshooting* appendix for suggested solutions to some common error messages):

T0	Normal termination
T1	Pump Error: Premature Busy, Reset Qty Exceeded, or No Pump Handle Busy
T2	No Fueling Pulses, Pulser Error, or Missing Pulse Detected
T3	Quantity Limit Exceeded
T4	Total Transaction Timer Expired
T5	Communication Error
T6	Manual Transaction
T7	Manager Activated
T9	Emergency Stop Pressed

Notes:

Notes:

Notes:

5.0 Menu Overview

```
MAIN MENU
---------

     A - SYSTEM ACCESS
     B - SYSTEM TIMES
     C - SYSTEM DEVICES
     D - CUSTOMER MESSAGES
     E - SYSTEM PARAMETERS
     F - RESTRICTIONS
     G - CARDS/ACCOUNTS
     H - TRANSACTION DATA
     I - SYSTEM TOTALS
     J - JOURNAL PRINTER

     'RETURN' FOR COMMAND LINE

ENTER CATEGORY:
```

5.1 USING THE MENUS

The system is initially in "command line" mode, meaning you must issue commands at the ">" prompt (such as **> SET TIME**). Menus are available, however, to simplify operations.

To turn the menus ON, do the following:

1. Get into the *privileged* mode by entering the privileged password at the prompt.

2. Enter **SET MENU** at the P> prompt (**`P>'**).

3. When the message **`ENABLE MENUS (Y/N)?'** appears, enter **Y**.

If you do *not* enable the menus, **SYSTEM2** continues to operate in "command line" mode, which is the mode used in the Petro-Vend ***K2500*** System.

To suspend the menus for one command, press **[ENTER]** several times at the prompt, until the command line reappears. After the command is entered at the command line, the menus reappear.

Use the **SET MENU** command to enable or disable the menus for your entire programming session.

To select a menu item, simply press the matching letter key, followed by the **[Return]** (or **[ENTER]**) key. For example, to select "System Access", press the **[A]** key, then press the **[Return]** key. You can use the backspace key (**[←]**) to change your selection *before* pressing the **[Return]** key.

A submenu is displayed after you select an item from the MAIN MENU.

To display a help screen for the MAIN MENU, type **`?'**, then press **[ENTER]**

.5.2 COMMANDS & OPTIONS

Some menus require you type only a letter corresponding to a command (such as SET) to activate a particular function; others require first a command and then an option (such as INSTALL, followed by PCT).

A "menu tree" with relevant commands (arranged for menus use) appears on Page 12. The three most used commands are **SHOW**, **PRINT** and **SET:**

- **SHOW**. Displays information from a **SYSTEM2** data base on the screen of your terminal or PC. This command does not require privileged status.

- **PRINT**. Sends data to your external journal printer to make a hard copy. Most (but not all) information can be printed, including all setup data (cards, fueltypes, prices, etc.) and all transaction information (time, date, amount, price, cost, etc.). This command does not require privileged status.

- **SET (FORMAT** and **CONFIGURE** work similarly). These commands are used to enter or change the setup data. These commands are privileged. Note that after FORMAT or CONFIGURE commands is used, one of the **`DOWNLOAD'** commands must then be entered.

Other menu commands are listed below:

- **INSTALL/REMOVE** - These commands activate and deactivate a device (such as a PCT). Privileged commands.

- **CLEAR** - There are several CLEAR commands, which erase transactions from the system data base. Privileged command.

5.3 HELP SCREENS

A help screen is available for each item listed in the submenus. These screens display information about the current menu.

To get a help screen, select a menu item in the usual manner but type **a question mark (?) before pressing [ENTER]**.

For example, to display the help screen for **SET TIME**, type **`C'** (for the command) from the System Times menu, and then type **`A?'** and then press **[ENTER]**.

To return to a current submenu, press the **[ENTER]** key a second time.

To return to the MAIN MENU, press the **[ENTER]** key until the Main menu reappears.

For help from a command line, type **HELP** at either the privileged or non-privileged prompt.

6.0 System Access Menu

From the MAIN menu, press **[A]**

```
-------------
SYSTEM ACCESS   ** PRIVILEGED **
--------------------------------
A: OPEN
B: CLOSE
C: CALL
D: HELLO
E: BYE
F: PASSTHRU
--------------------------------
^ENTER COMMAND:
```

6.1 OPEN/CLOSE

The OPEN and CLOSE commands give immediate access to pumps. Both commands are privileged, requiring the main password.

When a **CLOSE** command is issued, all activities in progress (pumping, printing a receipt, etc.) complete normally but no new activities are allowed to begin.

CAUTION

Closing the system with the **CLOSE** command is not the same as pressing the Emergency Stop button! Emergency Stop removes power from the pumps and interrupts the pumping process.

6.2 HELLO/BYE

HELLO is used to access the privileged mode. You'll be prompted for the system password (the factory default password is **`HELLO'**).

The **BYE** command exits the privileged mode.

Use the privileged mode to enter and change setup data. You MUST enter the "main" password to Privileged mode.

To return to normal mode from the command line **$>** prompt, type **BYE.**

See Page 51 for information on changing your passwords.

6.3 CALL

The **CALL** command creates a virtual link between the TERMINAL port and the MODEM port on the Fuel Site Controller.

Before executing the **CALL** command, a modem and terminal must be connected to the MODEM and TERMINAL ports, respectively.

After executing **CALL**, you can use a terminal connected to the FSC TERMINAL port to issue dialout commands directly to the modem.

To break the connection, type **BYE**.

6.4 PASSTHRU

The **PASSTHRU** command lets two intelligent devices (such as a Petro Vend SiteSentinel and a **SYSTEM2**) "talk" to each other via only one terminal. The terminal can be connected to either of the devices.

The second device must use the RS-232 standard interface, and must be set at the same baud rate and parity as the **SYSTEM2**: 7-bit, even parity, 1 stop bit.

Connect the second device (for example, the SiteSentinel) to the AUX3 port on the **SYSTEM2**. The terminal goes to the TERMINAL port as before. This must be done before issuing the **PASSTHRU** command.

After you issue the **PASSTHRU** command, **SYSTEM2** enters a "transparent" mode, where characters sent to it by the terminal or a modem are passed through to the second intelligent device. Any characters coming from the other device would likewise pass through to the terminal or modem.

Press **[CNTL] [Z]** to break the passthru connection.

7.0 System Times Menu

From the MAIN menu, press **[B]**

```
------------
SYSTEM TIMES   ** PRIVILEGED **
-------------------------------

A: SHOW              A: TIME
B: PRINT             B: TIME CHANGE
C: SET               C: DATE
                     D: SYSTEM ON TIME


----------------------------------------
^ENTER COMMAND:     ^ENTER OPTION:
```

7.1 TIME

The **SHOW TIME** or **SET TIME** command displays or sets the current time of day. The **SET TIME** command changes time as follows:

1. After issuing the command, you are prompted to enter the time.

2. Enter the time in the format: **`hh:mm am/pm'**. For example, **12:57 PM**.

   If PM is not specified, AM is assumed.

3. Press the **[ENTER]** key to complete the entry; this sets seconds to zero. The new time and current (or default) date are displayed.

Press **[ENTER]** to leave the current time unchanged.

7.2 TIME CHANGE

The **SET TIME CHANGE** command sets dates on which the internal clock moves ahead or back by one hour, to adjust for the change between daylight savings time and "standard" time. The change occurs at 2:00 AM on the date specified.

The **SHOW TIME CHANGE** command displays change dates in the system. The **SET TIME CHANGE** command changes the dates as follows:

1. After issuing the command you are prompted:

   ENTER DATE WHEN TIME IS MOVED BACK 1 HOUR:

2. Enter the "move-back" date in the format **mmm dd yyyy** (the year must be four digits). Press **[ENTER]**.

3. The following prompt appears:

   ENTER DATE WHEN TIME IS MOVED AHEAD 1 HOUR:

   Enter the "move ahead" date in the same way. *The word CHANGE can be abbreviated CH in these and other line commands.*

7.3 DATE

The **SHOW DATE** or **SET DATE** command displays or sets the current date within the system's memory. The **SET DATE** command changes the date as follows:

1. After issuing the command you are prompted to enter a date: **ENTER DATE (MMM DD, YYYY):**

2. Enter the date in the indicated format (for example, type **FEB 11, 1994** for February 11th, 1994.

3. Press the **[ENTER]** key to complete the entry; the new date is now displayed.

Press **[ENTER]** to leave the current date unchanged.

7.4 SYSTEM ON TIME

The **SHOW SYS TIME** and **SET SYS TIME** commands display or set the time the system goes ON and OFF, and the time during which only "transactions in progress" can be performed ("receipts only" time).

The **SET SYS TIME** command lets you set the following four options (time for the first three is entered in the same format as for System Time - **hh:mm**).

SYSTEM ON TIME - specifies when **SYSTEM2** goes active. When the system is on, it displays messages, and accepts card insertions or keypad entries.

SYSTEM OFF TIME - specifies when the system goes inactive. No new transactions are allowed to begin, but any in progress are allowed to finish.

RECEIPTS ONLY TIME - specifies when the system allows no new transactions to begin, but does allow "just completed" customers to get their receipts. This time would typically precede the **`SYSTEM OFF TIME'** by several minutes.

For example, a gas station that dispenses fuel from 9:00 AM until 7:00 PM would have the **`SYSTEM ON TIME'** set to 9:00 AM, the **`SYSTEM OFF TIME'** set to 7:10 PM and the **`RECEIPTS ONLY TIME'** set to 7:00 PM.

TIME ADJUST - this feature allows a software adjustment to the internal time clock. In the event of a noticeable time drift, a number of seconds can be added to or subtracted from each day, until a proper hardware adjustment can be made.

7.5 LIGHT ON TIME

The **SET LIGHT** command lets you set the **SYSTEM2** to turn the "pocket" lights in the FIT ON and OFF at designated times.

After selecting this option, the following prompts appear:

ENTER LIGHT ON TIME:
ENTER LIGHT OFF TIME:

Enter time in the same format as that for SYSTEM ON TIME (previous section).

8.0 System Devices Menu

From the MAIN menu, press **[C]**

```
SYSTEM DEVICE    ** PRIVILEGED **
---------------------------------

A: SHOW             A: FIT #...
B: PRINT            B: PCT #...
C: INSTALL          C: PCT #..POSITION#..
D: REMOVE           D: PUMP #...
E: CONFIGURE        E: PROGRAM
-----------------------------------------
F: SET              F: PUMP ON
-----------------------------------------
G: DOWNLOAD
-----------------------------------------
H: DOWNLOAD         G: FIT (#...)
                    H: PCT (#...)
-----------------------------------------
^ENTER COMMAND:     ^ENTER OPTION:
```

This section describes the System Devices menu by explaining each of the available menu options: **FIT #, PCT #, PCT #/Position #, Pump # and Program.** Commands applicable to each option are described in each section.

8.1 FIT

The **SHOW, PRINT, INSTALL, REMOVE** and **CONFIGURE FIT #** commands let you view, configure, install or remove FITs, and determine if the receipt printer will issue receipts, whether the keyboard is enabled or disabled, which PCTs to shut off when the emergency stop button is pressed, and reset the card reader error counter.

The FIT number is set with a DIP switch on the PV-269 board - refer to the System2 Installation Manual to set the FIT number.

8.1.1 Show FIT

Issuing a **SHOW FIT** command, along with a valid FIT number, displays the following message:

```
FIT INSTALLED
NO RECEIPTS
KEYBOARD ACCESS - DISABLED
PCTs TO SHUT OFF ON E-STOP:
1,2,3,4
CARD READER ERROR COUNTER: 0
-- ACCESS TO ALL PUMPS
```

Entries will vary depending on current FIT settings. The **CONFIGURE FIT** command (explained next) changes these settings.

8.1.2 Configure FIT

The following prompts appear one by one after using **CONFIGURE FIT** #:

ISSUE RECEIPTS (Y/N)? - Enter Y to have the optional receipt printer issue a receipt (N is default).If you enter **[Y]** to the **ISSUE RECEIPTS?** prompt, two additional prompts appear;

ENTER LIMIT TO RECEIVE RECEIPT IN DAYS
(0..99) - this is the number of days after a transaction that a customer can receive a receipt. Default is NO LIMIT (press **[ENTER]**).

CLEAR RECEIPT COUNTER (Y/N)? - The receipt counter keeps a running total of all receipts issued to date. It can be used to keep track of the receipt paper and to indicate when the paper is running low.

KEYBOARD OPTIONS (Y/N) ? - Default is N. Enter **[Y]** to display:

ENABLE KEYBOARD ACCESS (Y/N) ? - Default is N. With this feature enabled, a customer can enter their card number on the FIT keyboard. For more details about "cardless" card records, see the **INSERT CARD** command on Page 60.

The card reader is <u>not</u> disabled by enabling keyboard access.

SPECIFY PCTs TO SHUT OFF ON E-STOP (Y/N)? -
Default is N (meaning ALL PCTs shut off upon E-STOP). If you enter **[Y]** to select which PCTs will be turned off, you'll see:

ENTER PCTs TO SHUT OFF (#,#..) - Enter a range and press **[ENTER]**.

If there are card reader errors logged, the next prompt you'll see is:

CLEAR CARD READER ERROR COUNTER (Y/N) ?

This prompt is only displayed if the error counter is greater than zero. This counter keeps a running total of bad reads by the card reader.

A "bad" read is one where the card reader cannot read a card correctly in three sequential attempts. Such a failure could indicate that the card reader needs cleaning or replacement.

Enter **[Y]** to clear the counter. Enter **[N]** to keep the counter the same and to display the next prompt. The last FIT configuration prompt is:
CHANGE FIT ACCESS TO PUMPS (Y/N) ? -

Default is N. Enter **[Y]** to change which pumps can be activated by the specified FIT:

ENTER VALID PUMPS (p1, p2, ..)

Enter the **DOWNLOAD** *command after FIT configuration.*

8.1.3 Install FIT

This command activates the specified FIT, establishing a communication link between the installed FIT and the FSC.

FIT #1 is automatically installed on power-up.

8.1.4 Remove FIT

This privileged command stops the FSC from communicating with the specified FIT.

8.2 PCT

You can **SHOW, PRINT, INSTALL, REMOVE**, or **CONFIGURE** a PCT#. Each **SYSTEM2** FIT has a PCT board (part number PV-268) to control pump operations. This board, located in the FIT or in a remote cabinet, must be uniquely numbered.

PCT number is set with DIP switch #5 on each PV-268 board. See the *System2 Installation Manual* for details.

If the FSC is equipped with UPC (Universal Pump Controller) software, it can authorize fueling transactions via a pump control console (such as used in a self service station).

Pumps controlled by UPC software do *not* require a PCT.

8.2.1 Configure PCT

The **CONFIG PCT #** command (a number is required) first asks if a UPC will be substituted for the specified PCT. Press **[Y]** or **[N]** as appropriate.

If yes, you are asked if the UPC is internal (built into the FSC) or external (in a separate cabinet).

Refer to the appropriate System2 UPC manual before proceeding with UPC configuration.

If you want to reconfigure an installed PCT as a UPC, you must first remove the PCT using the command **REMOVE PCT #.**

When **SYSTEM2** is "cold started" (with no setup information in the data base), PCT #1 is automatically installed as not a UPC. A cold start is required: (1) when **SYSTEM2** is first installed or (2) if both the system power and backup battery fail.

8.2.2 Install PCT

The **INSTALL PCT** command activates the PCT, creating a link between the installed PCT and FSC.

There is a PCT for each FIT. This command does *not* install all positions for a PCT.

IMPORTANT

Pumps must be installed before the PCT is installed.

After installing each pump position, the PCT(s) themselves *must* be installed in order for the pumps to operate as part of the system.

- A PCT can be configured and kept nonoperative by *not* installing it.
- On power-up, PCT #1 is automatically installed.

8.2.3 Remove PCT

The **REMOVE PCT** command ends FSC-to-PCT communication to the specified PCT and deactivates all positions in the specified PCT.

All the programmed parameters remain intact; you can re-install the "removed" PCT without reconfiguring it.

8.3 PCT #/POSITION

You can **SHOW, PRINT, INSTALL, REMOVE**, or **CONFIGURE** a position within a PCT#. These commands configure or show individual positions within a PCT. PCT positions can be viewed, printed, installed, removed or configured. Each PCT can control up to eight pumps, located at positions #1 - #8.

8.3.1 Configure PCT #/Position

After issuing this command, the following parameters must be specified for each position:

Pump #

This is the pump number displayed to the customer for this PCT position (example: **`USE PUMP #12'**). This number is only a label and does *not* have to match the PCT position number.

A pump number can be assigned to more than one position on the same PCT. When that pump number is selected by a customer, all the associated positions are activated.

For example, say pump number "2" is assigned to positions #1 and #2. A customer with a large saddle-tank equipped truck could speed his fueling by putting Position 1's pump into one of the tanks and the Position 2 pump into the other tank.

Each PCT position records its own transaction; in this example, two transactions would be recorded (one for each pump).

Multiple pump use in this way is not possible when using UPC software.

Pulses Per Unit

Specifies the number of pulses per "unit" of fuel. A unit is typically gallons, liters or quarts. The prompted unit is the one related to the fuel type just entered. Default value is 100.

For more information on fueling units, see Page 51.

Optional Position Entries

The following optional items have defaults that should be appropriate for most systems.

Press **[ENTER]** to skip past an optional item and enter the default value. To change a default, enter your new value at the prompt.

Max Fuel Per Transaction

This is the maximum fuel amount to be dispensed for any transaction using this pump). Default is 10 units.

Max Fuel Per Transaction is *not* the same as Quantity Restriction (described on Page 54) or the Daily/ Monthly Allocations described in the Cards/Accounts section of this manual.

Enable/Disable Pump Sentry Feature

This option, when activated, deactivates the pump if three "zero quantity" transactions appear in a row, signalling possible pump or pulser trouble.

You will be prompted twice: **`PUMP SENTRY OPTIONS (Y/N) ?'**. Enter **[Y]** to enable the sentry.

If you enter [Y], the second prompt is `ENABLE PUMP SENTRY (Y/N) ?'; press **[Y]** or **[N]** as appropriate. Default is disabled.

A "premature busy" error does NOT increment the Pump Sentry counter.

Max Time For Fueling

This is the time limit (in minutes) given the user to fuel. Default is five minutes. Time is measured from when the pump is first activated; power is removed from the pump when Max Time is exceeded To deactivate this feature, enter **`0'**.

Max Time For Pump Handle

The maximum time allowed (in seconds) between pump activation and pump handle retrieval; default is 60 seconds. Enter "0" to deactivate.

Max Time For First Pulse

The maximum time allowed (in seconds) to detect the first fueling pulse from when the pump handle is first retrieved. Pump power is removed when the specified time is reached. Default is 60 seconds. Enter "0" to deactivate.

Max Time Between Pulses

The maximum time allowed (in seconds) between fueling pulses. Pump power is removed when this time is reached. Default is 60 seconds. To deactivate, enter "0".

Fueltype Code

This is a number, from 1 to 16, that represents the type of fuel this position will dispense (see Page 50 for a list of fuel types).

Tank

This is the tank number from which product will be pumped. A PCT position with the same fuel type as the tank from which product is drawn must be defined. Default tank number is the position number.

Clear Hose Totals

Lets you clear running pump totals; default is *no*.

Totalizer Value

Set a number to match the totalizer counter on the pump face; tracks the amount of fuel actually dispensed by the pump and as seen by **SYSTEM2**. Default is "0". For UPC-equipped systems, the last four prompts are repeated for up to four hoses.

You must enter the DOWNLOAD command (either directly, or via the [G] command in the System Devices menu) after configuring a PCT.

8.3.2 Install or Remove PCT/ Position

These commands activate or deactivate the specified PCT position.

8.4 PUMP

The **SHOW, PRINT, INSTALL, REMOVE** and **CONFIGURE PUMP #** commands let you reconfigure a PCT position, using the assigned pump number as a reference. The items are prompted as with the **`CONFIGURE PCT #...POSITION #'** command.

8.5 PROGRAM

The **SHOW, PRINT, INSTALL, REMOVE** and **CONFIGURE PROGRAM** commands let you used with UPC-equipped systems only. Refer to your UPC documentation for more information.

8.6 SET PUMP ON

This command lets you turn a pump on from the terminal or PC. You're prompted for the following customer information:

CARD #1
CARD #2
ACCOUNT #
DRIVER NAME
VEHICLE NAME
ACCOUNT NAME
ODOMETER
MISCELLANEOUS

No card validation is performed. Customer data is taken as entered and becomes part of the transaction record. Transaction termination is recorded as **`MANAGER ACTIVATED'**.

If the pump is never actually activated, a **`MANAGER ACTIVATED'** transaction is generated, but the pump number is recorded as **`0'**.

8.7 DOWNLOAD

Use **DOWNLOAD** after all **`CONFIGURE'** and **`FORMAT'** commands are complete. System 2 will NOT recognize any changes in configuration until a download is done. You do NOT have to do a download until all changes are finished.

8.8 DOWNLOAD FIT #/PCT

After issuing this System Devices command, enter the FIT number for which you want to download data. To download data for *all* FITs, press **[ENTER].**

After issuing this command you are prompted for a PCT number; enter the number of the PCT for which you want to download data, or just press **[ENTER]** to download data for all PCTs.

9.0 Customer Messages Menu

From the MAIN menu, press **[D]**

```
-----------------
CUSTOMER MESSAGES ** PRIVILEGED MODE **
---------------------------------------

A: SHOW           A: RECEIPT BODY
B: PRINT          B: RECEIPT HEADER
C: FORMAT         C: RECEIPT TRAILER
                  D: RECEIPT BONUS POINTS
                  E: DISPLAY (#...)
                  F: KEYBOARD (#...)
                  G: MESSAGES
                  H: DATE
---------------------------------------
^ENTER COMMAND:   ^ENTER OPTION:
```

This section explains how to format printed receipts (body, header, trailer, and bonus points), how to set up messages and prompts on the various types of FIT displays, and how to change the response from a keyboard input (for example, "Y" or "N").

9.1 WHAT'S A RECEIPT?

Sample receipts are shown on Page 36. There are four parts to a receipt:

- PRE-PRINTED header
- Header
- Body
- Trailer

The HEADERS take five lines:

- 2 top lines are blank, and act as a separator.
- 2 lines are the pre-printed header itself.
- 1 line is the separator between the pre-printed area and the receipt body.

For typeface ONE (the larger style), two of the top four lines are defined. For typeface TWO (smaller style), all four of the top lines are used.
The BODY uses up to 20 lines:

- 1 line at the top is blank separator
- 18 lines are user-programmable
- 1 line at the bottom is blank

The TRAILER uses up to 4 lines (in either language ONE or TWO).

Other receipt features are:

- The header and trailer/bonus points messages are printed in expanded format unless you specify otherwise.
- The receipt body fields can be set in any order
- Current date & time are automatically printed on each receipt
- Receipt size is fixed - make sure the programmed number of receipt body lines will fit onto the receipt.

If the dual language feature is enabled, receipts can be issued in either language. Refer to Page 52 for more details about the dual language feature.

9.2 RECEIPT BODY

In the body of the receipt, you define what data, and its order, are printed.

Fill in the first 10 characters of a line (the field entry), and then specify a Receipt Code (listed in the table opposite) to print data from the transaction or card file on the same line.

After issuing a command, you'll see:

ENTER (Show, Delete, Insert, eXit, Line #):

Select a function by entering the capitalized letter; for example, to exit, press the **[X]** key and then the **[ENTER]** key. Each function is described below:

Show Displays the current receipt body

Delete Removes a line from the receipt body

Insert Inserts another line into the body

eXit Ends this function

Line # This is a prompt for a valid line number to edit. The label and code items can be modified.

Figure 9-1 -- Receipt Codes

Code #	Transaction Data
1	Number Of Card 1
2	Number Of Card 2
3	Transaction Number
4	Product Name
5	Quantity Dispensed
6	Price Per Unit
7	Total Price
8	Driver Name
9	Vehicle Name
10	Company/Account Name
11	Site I.D.
12	Miscellaneous
13	Current Odometer Reading
14	Miles Per Gallon (MPG)
15	Liters Per 100 Kilometers
16	Pump Number
17	Account Number

9.3 RECEIPT HEADER

You can show, print, or format a header. The Receipt Header is the programmed message printed at the top of the receipt.

When formatting a header, enter up to four lines, one at a time. Each line can contain up to 11 characters. Red or black print can be specified for each line. If you don't want to use all four lines, press [ENTER] to skip lines.

If Dual Language is enabled, you'll be prompted for the number of the language (1 or 2). See Page 52 for Dual Language instructions. To format receipt headers for both languages, you must enter this command twice.

9.4 RECEIPT TRAILER

The receipt trailer programs a message to print at the end of each receipt. The format is the same as for the header.

9.5 RECEIPT BONUS POINTS

This option lets you specify a "coupon" value (based on amount of fuel dispensed) to print on each receipt. You can have a different message print (instead of the Receipt Trailer message) when Receipt Bonus Points is enabled.

When formatting the Bonus Points message, insert a `#' character in the message at the point you want the number of points to print. For example:

YOU HAVE EARNED # BONUS POINTS

9.6 SAMPLE RECEIPTS

The following sample receipts show some of the many ways you can set up the receipt format.

The first sample receipt uses Language #1 for all four of the header lines; only one of the footer lines (in typeface one) is used. Because only one footer line is defined, the receipt body can contain more information.

```
LINE 1    PRE-PRINTED
LINE 2    PRE-PRINTED

LINE 3    CUSTOM
LINE 4    CUSTOM

05/09/94  11:11 AM
CARD #:   1
TRANS #:  12
PRODUCT:  PREMIUM
QUANTITY: 10.7
PR/UNIT:  1.199
TOTAL:    12.83
DRIVER:   T. ROBINSON
ACCT.NAME:K.O. TRUCKING
SITE ID:  XXXXXXXXXXXXX
MISC:     123456789012
ODOM:     139750
PUMP #:   6
ACCOUNT#: 123456789

THANK YOU!
```

The following receipt uses one of the pre-printed header line (typeface one), and all four footer lines (also typeface one).

Note how the header "gives up" three lines so that the footer can grow. Note also how the body has shifted upwards to accommodate the larger footer.

```
LINE 1    PRE-PRINTED


05/10/94  11:11 AM
CARD #:   1
TRANS #:  12
PRODUCT:  PREMIUM
QUANTITY: 10.7
PR/UNIT:  1.199
TOTAL:    12.83
DRIVER:   T. ROBINSON
ACCT. NAME:K.O. TRUCKING
SITE ID:  XXXXXXXXXXXX
MISC:     123456789012
ODOM:     130445
PUMP #:   6
ACCOUNT#: 123456789

THANK YOU
FOR STOPPING AT
THE WORLD'S LARGEST
FUELING STATION
```

The receipt below uses both of the pre-printed header lines and all four of the custom-defined header lines. In this configuration, no footer lines can be defined.

```
LINE 1    PRE-PRINTED
LINE 2    PRE-PRINTED

LINE 3    CUSTOM
LINE 4    CUSTOM
LINE 5    CUSTOM
LINE 6    CUSTOM

05/09/94  11:11 AM
CARD #:   1
TRANS #:  12
PRODUCT:  PREMIUM
QUANTITY: 10.7
PR/UNIT:  1.199
TOTAL:    12.83
DRIVER:   T. ROBINSON
ACCT. NAME: K.O. TRUCKING
SITE ID:  XXXXXXXXXXXX
MISC:     123456789012
ODOM:     130445
PUMP #:   6
ACCOUNT#: 123456789
```

9.7 DISPLAY (#...)

The **FORMAT DISPLAY #** command determines the prompts that appear on the FIT display.

9.7.1 Display Type Overview

The FIT display guides customers through the fueling process with a series of prompts. The system generates default prompts (Page 39) for certain events.

Three types of FIT display are available:

- Standard 2x16 FIT display shows two lines of text with up to 16 characters per line.
- *Optional* 1x40 FIT display shows one line of text with up to 40 characters.
- *Optional* graphics display allows a picture to be displayed with a prompt. The Graphics Display is described in depth beginning on Page 40.

The type of FIT display that is installed is in the Status Report, produced with a **SHOW SYSTEM** command (Option A in the System Parameters menu).

9.7.2 Dual Languages

Using the Dual Language feature, prompts can be displayed in an "alternate" language if the card record for the current customer shows Dual Language enabled.

After a card or key has been successfully read, prompts appear in Language 1 or 2, depending on how that particular card record is configured.

See Page 52 for more information about the Dual Language feature.

9.7.3 Special Characters

Punctuation: In addition to numbers and letters, you may include most characters such as **`!'**, **`?'** and **`$'** in the FIT display prompts.

Beep: Add the **`}'** (right curly bracket) character to any FIT prompt to have an audible tone to sound at the FIT when the prompt is displayed. The curly bracket itself does not appear.

IMPORTANT

You MUST issue a DOWNLOAD command after altering a prompt, in order for it to be visible.

9.7.4 Default FIT Prompts

The following FIT messages are the default messages for Language 1. Language 2 defaults are blank.

Prompts #6 and #7 alternately display when prompting for a receipt. Messages #8 and #9 alternately display while waiting for a customer to activate the system (if #8 and #9 are six characters less then maximum, the current time is also shown.

If changing the default message, remember that only the text is changed, *not* any function. For example, **`INSERT CARD'** can be changed to **`PUT IN CARD'** but *not* to **`ENTER CURRENT TIME'**.

Many of the following messages are explained in the Troubleshooting Appendix, page 95.

Number	FIT Display Prompt	Number	FIT Display Prompt
1	SYSTEM OUT OF SERVICE	27	ENTER PIN:
2	READING CARD	28	ENTER ODOM:
3	REMOVE CARD	29	ENTER MISC:
4	INCORRECT READING	30	ENTER 2ND CARD:
5	CHECK CARD ORIENTATION	31	RE-ENTER PIN:
6	INSERT CARD FOR RECEIPT	32	RE-ENTER ODOM:
7	INSERT CARD FOR RECEIPT	33	(*blank*)
8	PETRO VEND SYSTEM2	34	(*blank*)
9	INSERT CARD	35	NOT IN CARD FILE
10	SYSTEM CLOSED	36	CARD EXPIRED
11	PLEASE WAIT	37	CARD RECORD EXPIRED
12	PRINTING RECEIPT	38	CARD INVALIDATED
13	TAKE RECEIPT	39	3 BAD PIN ENTRIES
14	PRINTER ERROR	40	ALLOCATION EXCEEDED
15	ISSUE RECEIPT?:	41	{*blank*}
16	ENTER PUMP #:}	42	(*blank*)
17	IN USE, RE-ENTER:	43	ACCOUNT EXPIRED
18	INVALID, RE-ENTER:	44	ACCOUNT INVALIDATED
19	PUMP HANDLE? RE-ENTER:	45	ACCOUNT # S DO NOT MATCH
20	FAULTY PUMP, RE-ENTER:	46	ACCOUNT REC NOT FOUND
21	UNAUTH ZED, RE-ENTER:	47	(*blank*)
22	RESTRICTED, RE-ENTER:	48	JOURNAL ERR -GET MANAGER
23	USE PUMP	49	SYSTEM BUSY -BUFFER FULL
24	INSERT 2nd CARD	50	(*blank*)
25	INCORRECT CARD	51	(*blank*)
26	ENTER CARD#	52	(*blank*)

Number	Keypad
1	NO
2	YES

9.7.5 Standard 2 x 16 FIT Display

After issuing the **FORMAT DISPLAY** command, enter the number of the FIT display prompt (Page 39) to edit.

If Dual Language is enabled, the system asks you to edit the display prompt for two languages. Initially, all first language prompts are in English and all second language prompts are blank.

After entering a prompt number, the current prompt and *four* vertical lines appear (two for each row of the message). These lines represent the maximum length of the FIT message; the new message must fit under the space between the lines - two rows, each with a maximum of 16 characters.

Upper and lower case letters can be used.

Enter the new prompt and press **[ENTER]** to complete the entry.

9.7.6 1 x 40 Display (Optional)

After issuing the **FORMAT DISPLAY** command, enter the number of the FIT prompt (Page 39) you want to edit.

After entering a prompt number, the current prompt and *two* vertical lines appear. These lines represent the maximum length of the FIT message; the new prompt must fit under the space between the lines. Upper and lower case letters can be used.

Enter the new prompt and press **[ENTER]** to complete the entry.

9.7.7 Graphics Display (Optional)

Features

If your system has the optional Graphics Display, pictures and text (in multiple styles) can be placed on one or more lines of the display. The current time can also be displayed with any prompt.

Up to 80 characters can be displayed. To combine pictures with text, you add "control characters" (on a computer, CTRL characters display as ^) to text prompts. In addition to defining pictures, these characters also allow you to:

- Position text on the display
- Select a text style
- Show the current time
- Clear the picture from the display.

Graphics pictures are shown on Page 43. Sample fonts and several examples of prompts with pictures and a list of control characters appear on Page 45.

The graphics codes described in this section can also be added to the keyboard responses and to the individual messages generated by the messaging feature. Refer to Page 46 for more information about these features.

Graphic prompts are limited to 80 text characters, each control character is equal to two text characters. Use the following prompt as an example:

`^1^Z ENTER CARD

This prompt consumes 18 characters: two for **`^1'** (the code that displays picture #1), two for **`^Z'**, (the code that selects the font), and twelve for the text **ENTER CARD** (including three spaces).

If Dual Language is *enabled*, the Graphics Display is limited to 10 prompts of 80 characters.

Graphics Display Command Syntax

Editing the text portion of a Graphics Display is like editing a standard one or two line display. After you issue a **FORMAT DISPLAY #** command, enter the number of the prompt to edit.

The text prompt for editing the Graphics Display is like a double version of the 1 x 40 display. When specifying the display number, you are shown the current prompt and two vertical lines spaced 40 characters apart.

The first 40 characters of the display prompt are shown on one line, in the space underneath the two vertical lines; the second 40 characters of the prompt (if applicable) are shown on a second line.

Enter the new prompt and press **[ENTER]** to complete the entry for the first line. Enter a second line for the prompt if desired.

To format another prompt, re-enter the command.

If Dual Language is enabled, you are shown the display prompts for both languages (the second language prompt is initially blank).

Graphics Display Picture Selection

Pictures are defined within the text prompt. To associate a picture with a display prompt, simply add the control character for that picture to the display prompt text.

Place the picture control character *before* the prompt text.

Only one picture can be connected to each message. You can tie the same picture to as many display prompts as desired.

Picture control codes, and FIT prompts typically attached to each picture, are shown on Page 43.

Graphics Display Text Position

To specify where on the display your text will go, insert one or more "position codes" in your prompt. There are 12 "lines" on the display; each of the 12 lines has a position code. These position codes are shown on Page 44.

The position code must be a CAPITAL letter and must be placed *before* the text. For example:

^C THIS IS ON LINE THREE

The **^C** in the above prompt specifies the text will appear on line three. If *no* position control character is specified, the text begins on the first (top) line of the display.

Graphics Display Font Selection

Your text messages can be displayed in one of the typestyles (illustrated on Page 44) listed below. The control character that defines the font is shown below as well:

- Serif, 20 characters per line (**^Z**)
- Sans-serif, 20 characters per line, Std set (**^Y**)
- Sans-serif, 20 characters per line, Intl set (^X)
- Serif, 40 characters per line (^**V**).

Serifs are the small "tails" on type. The first character below is a serif typestyle, while the second is sans-serif:

T T

All typestyles use fixed-width characters (in other words, an "l" takes up as much room as a "W".

IMPORTANT

Only one typestyle can be used per message.

If you do not specify a style, the last style you specified is used. If you do not specify *any* styles for any prompts, *Style 1* is used.

Showing the Time of Day

To show current time in a prompt, insert control character **`^T'** at the *end* of any display prompt.

The time is always displayed in the top right corner of the display. It appears in the current typeface.

Clearing the Graphics Screen

Insert the code **`^0'** (control *zero*) *before* the prompt text to clear the screen before displaying a prompt. This command is typically used with two-part messages; insert the command after the first part of the message to "erase" the screen for the second part.

A Graphics Display picture remains on the screen until one of the following occurs:

1. Another FIT prompt with a picture is displayed

2. A FIT prompt with the "clear screen" control code is displayed.

Display Cleaning Products

The Graphics Display has a thin anti-glare coating. DO NOT use harsh detergents or any petroleum-based solvents to clean the display!

The following products are safe for use on the System2 graphics display panel:

1. **AR Kleener - Anti-Reflective**

   Shield Lens Care Products
   Golden Valley, MN
   (612) 542-8276

   AR Kleener is available nationwide at Sunglass Hut stores

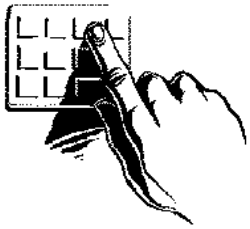
2. **Diamond Glaze Anti-Reflective Cleaner**

   Diamond Glaze, Inc.
   St. Paul, MN
   (800) 322-6644
   (612) 227-5560

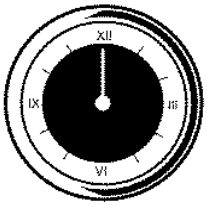
Call the manufacturers listed above for distributors in your area. Both are widely available in eyeglass stores or optometry clinics.

Graphics Display Picture Control Codes & Typical Prompts

`^1' - Mag Card: Stripe Left
(FIT prompts: #6, #7, #9, & #24)

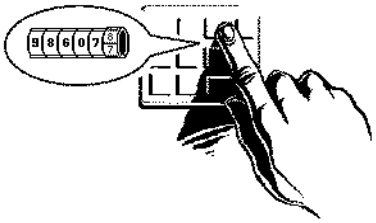


`^5' - Keypad Entry
(FIT prompts: #26,#27,#29,#30,#31,&#52)



`^9' - Wait
(FIT prompt: #11)

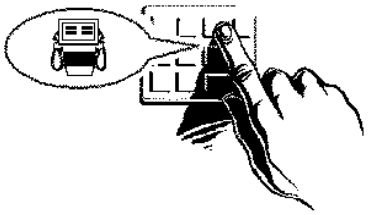
`2' - Mag Card: Stripe Right
(FIT prompts: #6, #7, #9, & #24)



`^6' - Odometer Entry
(FIT prompts: #28 & #32)

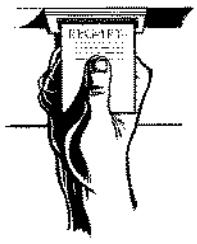
`^:' - Petro Vend Logo
(FIT prompt: #8)

`^3' - Optical Card
(FIT prompts: #6, #7, #9, #24)



`^7' - Pump Selection
(FIT prompts: #16, #20, #21, #22)

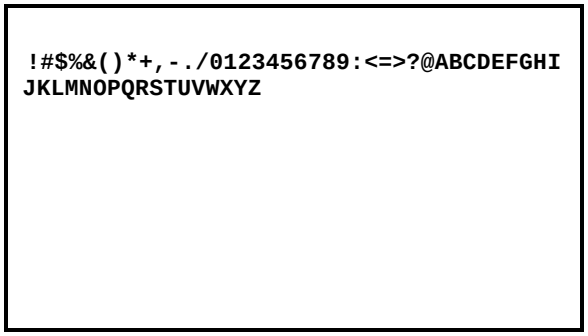
`^4' - ChipKey
(FIT prompts: #6, #7, #9, #24)



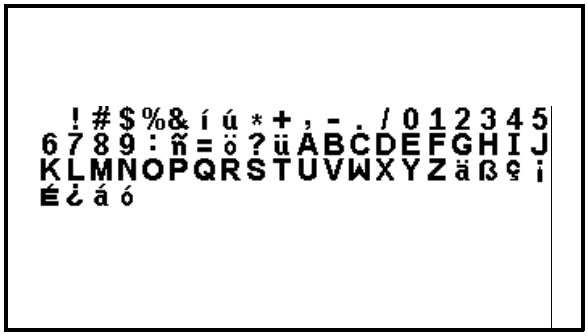
`^8' - Transaction Receipt
(FIT prompt: #13)

Graphics Display Typestyles and Position Codes

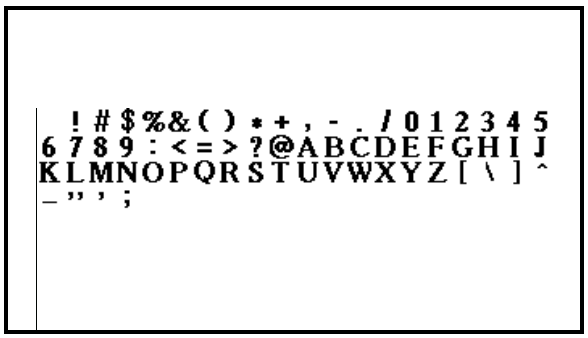
The following screens show the available typestyles, with their matching control code. Up to 12 lines of text (or up to 80 characters total) can be displayed for each typestyle. Position control codes (^A through ^L) specify where on the display the line of text appears; codes apply to all typestyles. For example, to have the prompt **INSERT CARD** appear at the bottom of the display (perhaps under a picture), you'd enter: **^LINSERT CARD**.



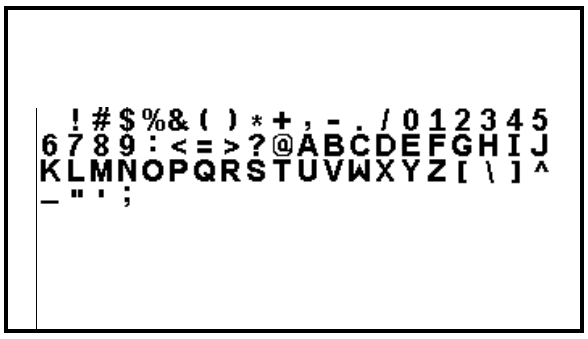
^V - Small Sans-Serif, 40 characters per line



^X - Large Sans-Serif, 20 characters per line International



^Y - Serif, 20 characters per line



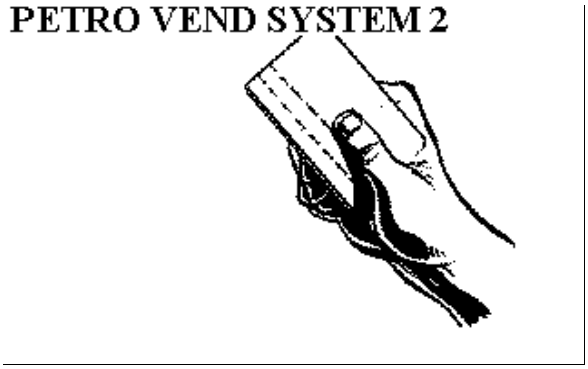
^Z - Large Sans-Serif, 20 characters per line

Graphic Code Summary

^A	Position on Line 1
^B	Position on Line 2
^C	Position on Line 3
^D	Position on Line 4
^E	Position on Line 5
^F	Position on Line 6
^G	Position on Line 7
^H	Position on Line 8
^I	Position on Line 9
^J	Position on Line 10
^K	Position on Line 11
^L	Position on Line 12
^T	Insert Current Time
^V	Small Sans-Serif Font
^X	Large Sans-Serif Font, Int'l
^Y	Large Serif Font
^Z	Large Sans-Serif Font, Std.
^0 (zero)	Clear Screen

Graphics Display Examples

The following displays result from the text/control code strings located under each.



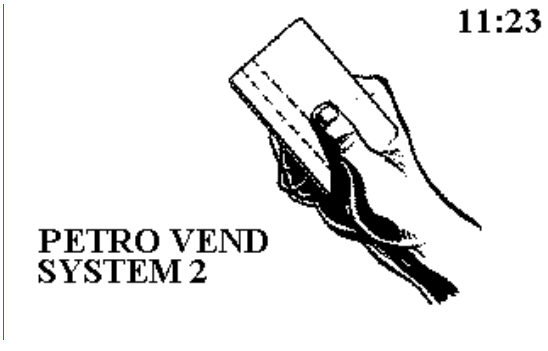
^1^Y^A PETRO VEND SYSTEM 2

^0^Y^E CHECK CARD ^F ORIENTATION

^4^Y^A INSERT CHIPKEY

^4^Y^I INSERT ^J CHIPKEY

^1^Z^I PETRO VEND ^J SYSTEM 2



^1^Y^T^I PETRO VEND ^J SYSTEM 2

9.8 KEYBOARD (#...)

The **FORMAT KEYBOARD** command changes the response that the customer sees when pressing the [YES] and [NO] keys. The response can be up to eight characters. The actual function of the two keys cannot be changed.

The default response is the key's label - "YES" or "NO". To change the **[NO]** key's response, enter **1** when prompted for **KEYBOARD NUMBER**. To change the [YES] key's response, enter **2** when prompted for a keyboard number.

If Dual Language is ON, you'll be prompted for two responses (for Language 1 and Language 2).

Enter a **DOWNLOAD** command to enable your changes.

9.9 MESSAGING

The **FORMAT MESSAGE** command ties specific messages to a particular account, single, driver and/or vehicle card. For example, a "Welcome" message could appear for new account members, or a "Just a Reminder" message could be displayed to check the oil.

9.9.1 Overview

Before using the Messaging feature, you MUST use the **SET CARD** command to format memory space for messaging. See Page 61.

When a message appears (before fueling), the customer must acknowledge it by pressing any key on the keypad. The response is *not* saved; it is used only to continue the transaction.

If your system has the receipt printer, the message can be printed on the receipt as well.

Each message has five programmable parts:

1. **Identifier:** A Card Number (up to 19 digits) or an Account Number (up to 4 digits).

2. **Message:** the message itself can contain numbers, letters and most punctuation (such as **`!'**, **`?'**, **`#'**, etc.). The length limit depends on the display you have: two lines of 16 characters, or two lines of 40 characters.

3. **Term -** when to stop displaying a message:

   - Duration - the number of days to display the message, from 0 (always displayed) to 99. Each message record also contains the days remaining until message stops, and how many times the message has appeared

   - Expiration Date - the last day to display the message (format=**`mmm dd, yyyy'**)

4. **Auto-Delete -** if enabled, automatically removes the message from the data buffer when display term is over

5. **Receipt** - prints the displayed message on the receipt.

9.9.2 Procedure

The card/account record must be created before you can program a message for it.

1. The first prompt you see after issuing a **FORMAT MESSAGE** command is:

ENTER (Edit, Show, Delete, eXit, [return] Card #):

Edit Display and modify all messages of a type - Single, Driver, Vehicle, or Account

Show Displays all the message records for a selected type

Delete Remove a message. Enter the identifier to select a specific message to delete, or enter **`ALL'** to delete all messages

eXit Return to the previous menu.

Card #/ Acct # Press **[ENTER]** to toggle between the **`Card #'** and **`Acct #'** prompts, then enter the number, followed by the message.

2. After selecting Edit, Show, or Delete, following prompt appears:

SELECT TYPE (Single, Driver Vehicle)

Enter the first letter of the message type, followed by **[ENTER]**, as follows:

[S]	Display all Single messages.
[D]	Display all Driver messages.
[V]	Display all Vehicle messages.
[A] or [ENTER]	Displays all Account messages.
[X]	Ends the command.

After entering a message type, the format information and number of times each message has been shown (**`Dis'**) are displayed. For example,

```
*********  SINGLE CARD MESSAGES
**************

Single  #1000         Exp. Date: FEB
13,1996 Days: |                     |
Dis: 1 Auto-Del: OFF Rec: ON
Call office immediately!


Single  #2000         Exp. Date:  FEB
15,1996 Days: 1
|               | Dis: 0 Auto-Del: ON
Rec: ON
Happy Birthday to You!


Single  #3000         Exp. Date:  FEB
24,1996 Days: 7
|                    | Dis: 0 Auto-
Del: OFF Rec: ON
Please check trans oil
```

Next, the display changes to the "two vertical lines" prompt, and existing message.

The message must fit in the space under the two vertical lines. The entry is "case-sensitive;" that is, upper and lower case letters are distinguished.

3. After entering a message, you'll see:

MESSAGE EXPIRE OPTIONS (Y/N) ?:

If you want to change the expiration date or duration of the message, press **[Y]**. If not, just press **[ENTER]**.

If you press **[Y]**, you are prompted:

ENTER (Duration or Exp. Date): NONE Days: (Y/N) ?:**

Enter either a duration (0 - 99) or an expiration date (**`mmm dd, yyyy'**) for the message. If duration is specified, an expiration date is also calculated and displayed. Press **[Y]** to complete the entry.

4. The next prompt is:

AUTO DELETE OPTION (Y/N) ?

Press **[Y]** for automatic message deletion when duration is up. You will have a confirmation prompt if you answer Y.

5. The next prompt is:

RECEIPT OPTION (Y/N) ?

Press **[Y]** to change the status. If you press **[Y]**, you are prompted:

PRINT MSG ON RCPT (Y/N) ?

Press **[Y]** if you want the message on the optional receipt. This concludes the message entry.

9.10 DATE

The **FORMAT DATE** command displays the following prompt:

ENTER (Show, Order, sEparator, eXit, Month #):

9.10.1 Procedure

Press the first letter of one of the options (below) to select that option.

Show Displays current data.

Order Two "orders" are available, each associated with a code number: (1) "month day year" and (2) "day month year"). You are prompted: **DATE ORDER CODE FOR LANGUAGE 1: enter `1'** for month first or **`2'** for day first (see Section 9.10.3.

If the dual language feature is enabled, you are prompted a second time for the date code. You can specify a different code for each language.

sEparator Select the two field separator characters

eXit Returns you to the previous menu

month # Changes the label(s) for the selected month (see the following section).

9.10.2 Month Labeling

The default date month labels are listed below:

MONTH #	Language 1	Language 2
1	JAN	01
2	FEB	02
3	MAR	03
4	APR	04
5	MAY	05
6	JUN	06
7	JUL	07
8	AUG	08
9	SEP	09
10	OCT	10
11	NOV	11
12	DEC	12

9.10.3 Date Order

Choose between day first (24 JAN, 1994) or month first (JAN 24, 1994) for the date order. Language 1 default is month first, while Language 2 default is day first.

9.10.4 Date Separators

Date separators distinguish the parts of the date; any printable ASCII character can be used.

Language 1 default is a space and a comma between the day (or month) and the year (example, **DEC 30, 1993)**. Language 2's default is two dashes (for example, **30-12-1993**).

10.0 System Parameters Menu

From the MAIN menu, press **[E]**

```
-----------------
SYSTEM PARAMETERS   ** PRIVILEGED **
-----------------------------------------
A: SHOW             A: SYSTEM
B: PRINT            B: SITE ID
C: SET              C: FUELTYPE (#...)
                    D: FUELING UNITS
                    E: PASSWORD
                    F: LANGUAGE
                    G: BYPASS
                    H: MENU
                    I: ECHO
                    J: BONUS POINTS
                    K: RAM
                    L: VERSIONS
-------------------------------------
^ENTER COMMAND:     ^ENTER OPTION:
```

10.1 SYSTEM

The **SHOW SYSTEM** or **PRINT SYSTEM** commands displays the following current system information (this is a read-only function; **SET SYSTEM** is not applicable):

FSC Software Version - for example, *22.01B.*

Checksums - Results of an FSC program check.

Display Type (see Page 38)

2 X 16: 2 lines with 16 characters each
1 X 40: 1 line with 40 characters
Graphics: 320 x 200 pixels

Date and Time - As set with *System Times. See Page 27.*

System State - ON, OFF or RECEIPTS ONLY. See Page 25.

Installed FITs - as set with *System Devices.* See Page 29.

Status of each FIT - RUNNING or DOWN

Number of receipts issued to date per FIT

Receipt Printer Errors - paper jams, outs, etc.

Installed PCTs - as set with *System Devices.* See Page 29.

Installed Positions - as set with *System Devices.* See Page 29.

Pump Sentry Alarm - a position number in parentheses shows a pump automatically put out of service by the system.

Low Tanks - Tanks that are below their programmed low levels. To set a "Low Tank" limit, see Page 66.

Power Failures - Dates and times of the last four power failures.

Battery Condition - The condition of the backup battery in the FSC.

10.2 SITE I.D.

Use the **SET SITE** command to enter a 12-character code to give a site a unique name. The system defaults a site "name" of "XXXXXXXXXXXX".

This code can be printed on receipts, and is used during backup and restore operations with an external computer. Your site ID must be *exactly* 12 characters long. It can contain spaces, though the first character cannot be a space.

10.3 FUELTYPES (#...)

Fuel units (gallons, liters, etc), prices, and names can be set for up to 16 different products. Each product is assigned a code number, which you assign during PCT configuration. Fueltype data can be assigned individually to each pump or hose.

The following are the system default names for the 16 products. Each product has a default "price-per-unit" of $1.00. The "unit" default is gallons; this can be changed using the **SET FUELING UNITS** command, Page 51.

CODE	DEFAULT PRODUCT
1	Unleaded
2	Premium
3	Regular
4	Marked Fuel
5	#1 Diesel
6	#2 Diesel
7	Gasohol
8	Alcohol
9	Propane
10	LPG
11	Lubeoil 1
12	Lubeoil 2
13	Trans Oil
14	Coolant
15	Water
16	Air

To change a fuel type:

1. Issue the **SET FUELTYPE #** command, where **`#'** is the code number (1-16). The first prompt is:

   ENTER FUELING UNIT CODE (1-3):

   A fueling unit (gallon, litre, quart) must be specified with the **SET FUELING UNITS** command (next section). Default code is "1". The default for code 1 is GALLON.

2. The next prompt is:

   CHANGE PRICE (Y/N)?

   To keep the price the same, press [ENTER]. If you want to change price per unit, enter [Y] to display the next prompt:

   ENTER PRICE PER GALLON

   Default price is $1.00 per unit. Price can be specified to a tenth of a cent; for example, **`$1.059'**. A price of `$0.000' can be specified for non-retail sites.

IMPORTANT

The *current* fuel price is recorded for every transaction. Changing the fuel price does *not* affect *completed* transactions.

3. The next prompt is:

   CHANGE PRODUCT NAME (Y/N)?

   To keep the name the same. press [ENTER]. To change it, press [Y] to display the next prompt:

   ENTER FUELTYPE 1:

   Names can be up to ten characters long. Type a name, and press [ENTER]. Change other fueltype codes as desired.

10.4 FUELING UNITS

Three different unit-of-measure labels can be connected to product types (previous section). These are simply labels - no conversion is done.

The default labels, and their "Fueling Unit Codes", are:

(1) gallon (2) liter (3) quart

The code numbers (1, 2, or 3) are input at the **FUELING UNIT CODES** prompt during the **SET FUELTYPES** procedure (Page 50).

To change the default values:

1. Enter the **SET FUELING UNITS** command. You are then prompted for each of the three labels:

   ENTER FUELING UNIT 1:
   ENTER FUELING UNIT 2:
   ENTER FUELING UNIT 3:

   To leave a unit the same, just press **[ENTER]**.

2. To change a unit, enter a label of up to 10 characters and press **[ENTER]**.

10.5 PASSWORD

There are three modes of operation for **SYSTEM2**: Normal, Privileged and Restricted.

Normal - Most SHOW and PRINT commands are useable in normal mode. The screen prompt (in non-menu mode) is **>**.

Privileged - Most SET or FORMAT commands require privileged access. The prompt is **P>**.

Restricted - This mode, signified by a **$** prompt, requires a "SHOW" password be entered for *any* screen display to be visible. This mode is off until you enable it with **SET PASSWORD**.

IMPORTANT

If all you see is a dollar sign prompt (**$),** Restricted mode is ON. To turn this mode OFF, use the SET PASSWORD command (Privileged mode) to turn it OFF.

The **SET PASSWORD** command changes the passwords for the Privileged and Restricted modes, and enables or disables the Restricted mode.

Your unit comes from the factory with all passwords set as HELLO, and the Restricted mode OFF. Passwords do not have to be changed, or the Restricted mode enabled, in order for **SYSTEM2** to operate.

This command is also used to change the Modem password - see Page 83.

To change any or all passwords:

1. Enter **SET PASSWORD**. The system prompts first for the MAIN (Privileged mode) password.

2. Enter up to six characters for the main password (or press **[ENTER]** to retain the old password). There is no difference made between upper and lower case letters. The system now prompts you for the MODEM password.

3. Enter a new Modem password or press **[ENTER]** to retain the old password and move to the next prompt.

4. After entering the modem password, the next prompt enables or disables the Restricted mode:

   `SHOW' PASSWORD OPTIONS (Y/N) ?

5. If you don't want to use the Restricted mode (it is disabled by default), press **[ENTER]** to skip. If you press [Y]:

   ENABLE SHOW PASSWORD (Y/N) ?

6. Press **[Y]** or **[N]** as appropriate. If you enter **[Y]**, you are prompted to enter a new show password.

10.6 LANGUAGE

The Dual Language feature allows **SYSTEM2** to be "bi-lingual" to a certain degree - to display or print two different languages.

Use the privileged **SET LANGUAGE** command to turn the Dual Language ON or OFF. Simply answer [Y] or [N] to the **ENABLE DUAL LANGUAGE (Y/N)** prompt, and press **[ENTER].**

A Language Type is programmed into each card record. When the card is read, the FIT display language changes to the programmed language. Optional receipts also print out in the specified language.

To program bilingual cards, use the **SET CARD** command (see Page 61). The display prompts are explained in detail on Page 38. Receipts are explained beginning on Page 34.

Certain prompts cannot be defined for a second language - prompts **#2, 3, 4, 5, 6, 7, 8, 9, 24, 25, 26** and **35** (Page 39) are displayed *before* a card or key has been read, these prompts should *not* be programmed for a second language.

10.7 BYPASS

This command defines which customer entries will be required before the customer can fuel. Choose from the following entries:

- PIN
- Miscellaneous
- Odometer

The selected entry can be prompted as follows:

- Disabled for ALL cards
- Enabled for ALL cards
- Determined by the card information.

10.8 MENU

The **SET MENU** command turns the system's menus ON or OFF. When menus are OFF, commands must be entered at the prompts (**>**, **P>**.).

Menus are shown on the first page of each section of this manual. When issuing commands without menus, you typically type the command as it appears on the menu. For example, for the menu ON/OFF function, the menu lists SET on the left and MENU on the right (**SET MENU)**.

Menus are ON by system default, and appear automatically at system power-up.

10.9 ECHO

During programming, the FSC sends back (echos) every character it receives from the terminal if echo is enabled. Echo must be ON in order for you to see the characters as you type them into the terminal.

Echo is typically disabled with the **SET ECHO** command only when interfacing to an external computer. Refer to Page 84 for external computer operation.

10.10 BONUS POINTS

The **SET BONUS POINTS** command allows you to specify a "coupon" value (based on the amount of fuel dispensed) to be printed on each receipt. A Bonus Points message can also be specified.

For example, bonus points can be awarded to customers as credit toward using a local car wash facility.

10.11 RAM

Initially configuring your **SYSTEM2** requires you define the size of the system memory with the **SET RAM** command.

The card file and transaction records are stored in RAM chips on the FSC board. The number of RAM chips on your FSC board depends on the amount of RAM you ordered.

Enter the privileged command **`SET RAM'**. You are prompted to enter the code appropriate for your system:

CODE TO ENTER	**MEMORY LEVEL**	**RAM SIZE**
0	1 (Standard)	256 Kb
1	2 (Optional)	512 Kb
2	3 (Optional)	1 Mb
3	4 (Optional)	2 Mb

Press **[ENTER]** to keep the current code. You cannot enter a memory code if there isn't sufficient RAM in the system (for example, you can't enter "2" if you only have 512 K of memory).

Privileged mode is lost if the system rejects a RAM entry; the password must be re-entered.

If you don't know the RAM size, you can determine it by trial and error. Start by entering **3** and continue on down until **SYSTEM2** accepts the entry.

10.12 VERSION

The **SHOW** or **PRINT VERSION** command displays the current software version (for example, **22.01B**). This information is also included in the Show System display (Option A in System Parameters).

This is a read-only function: there is no **SET VERSION** command.

11.0 Restrictions Menu

From the MAIN menu, press **[F]**

```
------------
RESTRICTIONS      ** PRIVILEGED **
----------------------------------------
A: SHOW           A: PUMP RESTRICTIONS
B: PRINT          B: QUANTITY RESTRICTIONS
C: SET            C: SECURITY
----------------------------------------
^ENTER COMMAND:   ^ENTER OPTION:
```

11.1 PUMP RESTRICTION

The **SET PUMP** command defines codes for up to 15 sets of pump restrictions. Restriction codes are used when configuring card files (see Page 61), in turn defining what customers can use what fuel.

Use the following pump configuration as an example on setting restrictions:

- *Leaded* fuel is dispensed from pump 1, and cannot be used in newer trucks
- *Unleaded* fuel is dispensed from pump 2, and can be used in either new or old trucks
- *Premium* fuel is dispensed from pumps 3 and 4, and should not be available to any trucks.

Enter pump #1 as valid for CODE 1, and pumps #1 and #2 as valid for CODE 2. Do not assign pumps 3 or 4 - pumps not entered as valid are automatically assumed invalid.

Now use Codes 1 and 2 to configure the vehicle card files for the trucks; other codes could be created to include the premium fuel pumps as required. *The default for all codes is ALL VALID.*

Code 0 can be used to indicate no restrictions. In the example above, code 0 could be specified for vehicles that would have access to all four pumps.

Pumps must be installed to be valid (see Page 29).

11.2 QUANTITY RESTRICTION

11.2.1 Overview

Fifteen Quantity Restriction codes can be defined with the **SET QUANTITY** command. Restrictions can be by sale amount or by volume (gallons, liters or quarts).

The Quantity Restriction codes specify how much product a particular customer has access to. Quantity Restriction is often set to match a vehicle's tank size. Sale defaults are as follows (Code 0 turns OFF the function):

CODE	PRICE RESTRICTION
0	No restriction
1	$20
2	$40
3	$60
4	$80
5	$100
6	$120
7	$140
8	$160
9	$180
10	$200
11	$220
12	$240
13	$260
14	$280
15	$300

11.2.2 Procedure

1. After entering **SET QUANTITY**, you'll see:

   QUANTITY RESTRICTION CODES:

   CODE 0: NO RESTRICTIONS
   CODE 1: $

2. Press **[ENTER]** (without an entry) to select the default value, or enter a different value.

3. After the last entry, you are prompted with:

   QTY RESTRICTION VALUE OPTIONS (Y/N)

   If you press **[Y]**, you are prompted:

   USE VALUES AS $ (Y/N) ?

   Press **[Y]** to use the values as dollars or **[N]** to use the values as quantities.

The quantity values represent gallons, liters or quarts, depending on the quantity units. See Page 51 for Fueling Units information.

11.3 SECURITY

11.3.1 PIN Number Generation

Each system has a "security table" built into the software. The security table is made up of ten 2-digit hexadecimal numbers (in two rows of five) used by the **INSERT CARD** and **COPY CARD #** commands for automatic PIN number generation.

The default values are the same for every **SYSTEM2** - you MUST set new values with this command in order to generate unique PIN numbers for your system.

11.3.2 Procedure

After entering the **SET SEC** command, you are prompted with the current value of ROW 1 (the system defaults are shown):

ROW 1: 01 23 45 67 89

1. Enter five 2-digit hex numbers, pressing the **[ENTER]** key after each.

   Hex numbers include the decimal numbers 0 to 9 and the letters A to F.

   The entries should be as random as possible to maximize the uniqueness of the PIN numbers that will be generated from this table. For example, **`A0 E9 83 DD 1C'** is good, but **`12 12 12 12 12'** is *not*.

2. After the fifth entry, you are prompted for the second row (ROW 2) in the same way as the first.

3. Again, enter five different 2-digit hex numbers.

4. After entering the last digit in row 2, you are prompted with:

   SECURITY CODE: 00
   ENTER CODE:

The Security Code (default is **00**) gives an additional degree of randomness to the security table. Changing only the security code causes different PIN numbers to be generated from the same security table. Enter any 2-digit hex number (except **`00'**) for this code.

IMPORTANT

Be sure to record your Security Table numbers on the worksheet (Appendix A)! If you are reconfiguring your system, or wish to generate PIN numbers to match another SYSTEM2, the row and security code numbers must match your original entries!

K-3000 Users: To generate PIN numbers compatible with a K-3000 system, enter the first five 2-digit security numbers from the K-3000 System Data Sheet for Row 1. Enter the next five 2-digit security numbers for Row 2.

DO NOT use the last six numbers listed on the K-3000 data sheet. Enter **`00'** for the security code.

12.0 Cards Menu

```
--------------
CARDS          ** PRIVILEGED **
---------------------------------------
A: SHOW              A: CARD
B: PRINT
C: SET
---------------------------------------
D: VALIDATE
E: INVALIDATE
---------------------------------------
^ENTER COMMAND:     ^ENTER OPTION:
```

12.1 OVERVIEW

The above submenu appears after selecting Option G from the Main Menu. This menu lets you do the following:

The first step is to divide the buffer into two sections: *Transaction Data* and *Card Data*. Do this using Choice #1 of the **SET CARD** command (see below).

Choice #2 is used to program the keyboard entry options. Choice #3 selects the keyboard access type. Choice #4 sets the keyboard card control type.

12.2 SET CARD

Enter the **SET CARD** command to display the following menu:

```
[1] Set card/transaction buffer size.
[2] Set keyboard entry options.
[3] Set keyboard access type.
[4] Set keyboard card control data.
[RETURN] Return to main command line

Enter choice:
```

12.2.1 Set Card/Transaction Buffer Size

This option splits the transaction buffer into two or three sections.

1. After pressing (1), you'll be prompted:

TRANSACTION BUFFER WILL BE CLEARED (Y/N) ?

CAUTION

This command erases *all* transaction data

Enter `**Y'** to delete the buffer and continue.

2. The next prompt is:

ENTER TRANSACTION SIZE CODE

The transaction size code is determined by the formula:

size code = number of transaction/25

For example, to store 100 transactions, enter a

size code of four (100/25 = 4).

The transaction capacity of the **SYSTEM2** depends on the amount of RAM in the system (which you can see with the **SHOW RAM** command).

3. Enter a size code; you will now see system configuration data:

```
# OF CARDS: ######
# OF TRANSACTIONS:
-- SAVE THIS CONFIGURATION (Y/N) ?
```

4. To change the configuration, enter **`N'** at the prompt to select a different size code.

   To save the current configuration, enter **`Y'** at the prompt.

   The system displays **PLEASE WAIT!** while it validates the cards. This process takes anywhere from a few seconds to several minutes, depending on the amount of RAM.

IMPORTANT

DO NOT use the same card number for more than one card; in particular, do not give a Driver and a Vehicle card (used in pairs) the same card number.

You will see **DONE!** when validation is completed.

12.2.2 Set Keyboard Entry Options

SYSTEM2 can be set to request the following three types of customer information:

- Current odometer reading
- Miscellaneous data (for department section, job number, account code, etc.)
- PIN number.

These prompts can be set for all cards, for no cards, or only for cards that are coded for a keyboard entry.

Select **[2]** to display the following menu:

```
Keyboard entry options:
[1] Disable for all cards
[2] Enable for all cards
[3] Determined by card
[RETURN] No change

Odometer entry:
```

Enter 1, 2 or 3, then press **[RETURN]**. The default value is **[3] Determined by card.**

You are next prompted for the Miscellaneous entry and then for the PIN entry. Enter a code number for each. The menu is returned to the display.

The PIN entry cannot be disabled.

K-3000 Users: When programming your **SYSTEM2** to work with a K-3000, observe the following guidelines:

- Use the K-3000 Program Selector Switches to enable the odometer ("mileage"), miscellaneous and PIN ("security number") keyboard entries:
  - Keyboard entry is *disabled* for a K-3000 when these switches are open. This is the same as selecting option **[1]** for a particular keyboard entry in **SYSTEM2**.
  - Keyboard entry is *disabled* when the selector switch is closed. Cards may be coded to bypass (i.e., disable) an entry or entries. This is the similar to selecting option **[3]** for a particular keyboard entry.
- There is no K-3000 equivalent for keyboard entry option [2] in the **SYSTEM2** system.

12.2.3 Set Keyboard Access Type

In lieu of a card or key, the **SYSTEM2** can be accessed via entries on the leypad. Keyboard Access Type defines the card type that a keyboard access duplicates.

After selecting this option, you will see:

Set keyboard access type (Single, Driver, Vehicle):

Enter **`S', `D',** or **`V'** to select a card type, or press **[RETURN]** to enter the current value. Default is Single.

When a card number is entered via the keyboard, **SYSTEM2** uses code 15 for quantity and pump restriction.

Odometer, miscellaneous and PIN entries are *always* prompted if keyboard entries are determined by card (see Section 12.2.2).

IMPORTANT

To enable keyboard entry, FIT DIP switch 2 - Position 4 - must be set correctly.

Keyboard Access numbers should *not* be the same as Card Numbers! For example, if you assigned Driver Card number 1000 *and* Vehicle Keyboard Access number 1000, *both* numbers will always be either valid or invalid - you *cannot l*ock out only the card or only the keyboard access.

12.2.4 Set Keyboard Card Control Data

After three bad card reads, the system can optionally allow the customer to enter his own card number. This option is set with a switch in the FIT.

When you select this choice, you are prompted:

ENTER THE CARD CONTROL DATA STRING

You are prompted for the card control data which will be appended to the end of the customer's entry. The system will use this as the customer card data when customers key in their card number.

This data string will be used for all cases where customers key in data.

12.3 SHOW CARD

When the **SHOW CARD** command is entered, the following menu is displayed:

```
[1] Display card (in)validation
status.
[2] Display keyboard entry settings.
[3] Display keyboard access type.
[4] Display expiration date code
table.
[RETURN] Return to main command line.

                    Enter choice:
```

Option [1] displays the validation status of a card or range of cards. You are prompted for the card number or range. Data are displayed in the following manner.

```
1-> VVVVVVVVV VVVVVVVVV VVVVVVVVV VVVVVVVVV VVVVVVVVV
51-> IIIIIIIIIV VVVVVVVVV VVVVVVVVV VVVVVVVVV VVVVVVVVV
```

In the above display, **`V'** indicates a card is valid; **`I'** indicates a card is invalid. In the example above, cards 1 - 50 and 60 - 100 are valid; cards 51 - 59 are invalid.

Options [2], [3], and **[4]** display the keyboard entry settings, access type, and expiration date code table.

12.4 VALIDATE / INVALIDATE CARD

When either the **VAL CARD** or **INVAL CARD** command is entered, the maximum card range which can be validated or invalidated is displayed. Proceed:

1. You are prompted to enter a card number or a range of card numbers. Enter a range and press **[ENTER]**.

2. If you select a range of more than 100 cards, you are prompted a second time.

If numerous cards are being processed, you will see **PLEASE WAIT** during execution.

You will see **DONE** when the process is finished.

A sample sequence appears below:

```
Display
Keyboard
--------------------------------------------------
--------
P>
VALIDATE CARD
P>VALIDATE CARD
Maximum card range: 1-19999

Enter card # or card range to be validated,
Press [RETURN] to exit.
Card (range):
33333
Card (range):  10000  DONE!
Validated card(s):
Card (range):
1-10000
Validated card(s):  1-10000 DONE!                Y
Validated card(s):  1-15000 DONE!
Validated card(s):  1-19999 (Y/N)?  DONE!
Card (range):
[ENTER]
P>
```

13.0 Transaction Data Menu

From the MAIN menu, press **[H]**

```
----------------
TRANSACTION DATA
-------------------------------------------------------
A: SHOW              A: TRANS DATE TIME CARD VEHICLE
B: PRINT      B: TRANS DATE TIME CARD VEHICLE SUMMARY
              C: TRANS (#...)
-------------------------------------------------------
C: SET               D: TRANS
D: CLEAR
-------------------------------------------------------
E: CLEAR      E: TRANS DATE #... SEQUENCE #...
-------------------------------------------------------
^ENTER COMMAND       ^ENTER OPTION
```

13.1 SHOW/PRINT TRANS DATE TIME CARD VEHICLE

This function displays or prints completed transactions stored in the **SYSTEM2** data base.

Even though *all* transactions are recorded by the system, what you actually see is determined by the **SET TRANS** command, described below.

When you issue a **SHOW TRANS** or **PRINT TRANS**, you are prompted as follows:

ENTER DATE:
ENTER TIME:
ENTER CARD:
ENTER VEHICLE:

There are four possible types of responses to these prompts. Pressing **[ENTER]** at each prompt tells the system to ignore that parameter.

To narrow the range of transactions to print or show, enter a specific time, date, or number at a prompt. For example, to display only the transactions from January 22, 1994, enter **JAN 22 1994** at the date prompt, and then press **[ENTER]** at the other four prompts.

When specifying the time or date, you can also include one of two following prefixes:

< ("less than" sign). Will include all transactions up to and including the current time or date. For example, to include all transactions up to and including Jan 22, 1994, enter **<JAN 22 1994** at the date prompt.

> ("greater than" sign). Will include all transactions starting with and including the specified time or date. For example, to include all that occurred after 5:00 PM (and before midnight), you would enter **>5:00 PM** at the time prompt.

An example of a typical transaction is shown on the next page.

```
>PRINT TRANSACTION 161
   -ALLOW WRAP AROUND
   -SAVE UNAUTHZ'D USERS ALSO
   -TRANSACTION BUFFER SIZE: 25

 SEQUENCE #: 123
 REASON FOR TERMINATION: NORMAL
 FEB 22, 1994   07:11 PM
 TRANSACTION #: 123
 CARD #: 20001
 FUELTYPE: UNLEADED
 PUMP #: 3
 QUANTITY: 25.000 GALLON
 PRICE: $1.000
 TOTAL: $25.00
 ODOMETER: 66555
 MISCELLANEOUS: 1234567890
 --RECEIPT ISSUED
```

13.2 SHOW/PRINT TRANS DATE TIME CARD VEHICLE SUMMARY

This command displays only the product totals without listing all the transactions. For example,

```
-ALLOW WRAP AROUND
-SAVE AUTHZ'D USERS
-TRANSACTION BUFFER SIZE: 25

      *** PRODUCT TOTALS ***

UNLEADED    : 46.080 GALLON  TOT:
$46.08
PREMIUM     : 35.840 GALLON  TOT:
$35.84
REGULAR     : 34.900 GALLON  TOT:
$34.90

TRANSACTIONS: 9     GRAND TOTAL:
$116.82
           AVERAGE: $12.98
```

13.3 SHOW/PRINT TRANS (#...)

This command is quick method of displaying transaction data. You are prompted only for the transaction number.

13.4 SET TRANS

The size of the transaction buffer is set when you define card buffer size (see Page 61).

The **SET TRANS** command specifies how the transaction buffer is to be configured. The first prompt is:

SET WRAP AROUND OPTIONS ?

If wraparound is enabled, and the transaction buffer is full, the **SYSTEM2** overwrites (erases) the older transactions when new transactions are received.

When wraparound is disabled, transactions can *not* be overwritten; *no* fueling is allowed if the buffer is full. If you enter **[Y]**, you will be prompted again:

ENABLE WRAP AROUND ?

Press **[Y]** to confirm.

> **IMPORTANT**
>
> Do not enable wraparound unless you are certain that transaction data will not be accidentally destroyed.

The next prompt is:

RE-DEFINE TRANSACTION ?

Enter **[Y]** to redefine transactions and display:

TRANS=UNAUTHZ'D USERS ALSO ?

If you enter **[Y]**, the system processes an unauthorized attempt to use the system as a transaction and logs the event in the transaction buffer.

Entering **[N]** causes the system to ignore any unauthorized users and events; only cases where a pump was activated by the **SYSTEM2** are recorded.

The third **SET TRANS** prompt is:

SPECIFY DISPLAY FIELDS ?

This lets you tell the system which fields to display when a **SHOW TRANSACTION** or **PRINT TRANSACTION** command is issued. Choose from the following fields:

DRIVER & VEHICLE
DATE & TIME
TRANS #
CARD #1
CARD #2
FUELTYPE
PUMP #
QUANTITY
PRICE
TOTAL
ODOMETER
DISTANCE PER UNIT
MISCELLANEOUS
RECEIPT STATUS

Chosen fields are also used in the External Computer Transactions (see Page 84).

If access was denied to a fueler, only the first four fields and the transaction number are recorded for that transaction.

There must be at least one transaction recorded in your system in order to show all the selected data fields.

The last SET TRANS option (displayed after the account number prompt) is:

COMPUTER FORMAT CHECK DATA IN HEADER ?

When transferring data to an external system in the computer format, an optional data check can be prefixed to the transaction header to provide greater data integrity. The data check includes: (1) the number of records and (2) the sum of the quantities for records. See Page 84 for External Computer instructions.

Press **[Y]** to *enable* or **[N]** to *disable* the data check.

13.5 CLEAR TRANS

The **CLEAR TRANS** command clears all transactions. To ensure that you do *not* clear transactions accidentally, the system prompts you a second time before clearing the transactions.

You can *not* clear transactions in the middle of the buffer.

13.6 CLEAR TRANS DATE #... SEQUENCE #...

This version of the **CLEAR TRANS** command clears all transactions that occurred up to and including the specified transaction on the specified date.

14.0 System Totals Menu

From the MAIN menu, press **[I]**

```
----------------
SYSTEM TOTALS
-----------------------------------------------------
-----------
A: SHOW             A: TRANS DATE TIME CARD VEHICLE
B: PRINT      B: TRANS DATE TIME CARD VEHICLE SUMMARY
              C: MIDNIGHT
              D: DAY
              E: SHIFT
-----------------------------------------------------
------------
C: SHOW             F: PUMP #... TOTALS
D: PRINT      G: PCT #... TOTALS
E: CLEAR
-----------------------------------------------------
------------
F: SHOW             H: FUELTYPE (#...) TOTALS
G: PRINT
-----------------------------------------------------
------------
H: SHOW             I: TANK (#...)
I: PRINT
J: SET
-----------------------------------------------------
------------
^ENTER COMMAND      ^ENTER OPTION
```

14.1 SHOW/PRINT TRANS DATE TIME CARD VEHICLE

This version of **SHOW TRANS** or **PRINT TRANS** lets you print and show the completed transactions that stored in the **SYSTEM2** data base.

This function is very similar to the SHOW/PRINT TRANS command explained in the *Transaction Data* menu, Page 61.

14.2 SHOW/PRINT TRANS DATE TIME CARD VEHICLE SUMMARY

This command displays only product totals, without listing all the transactions.

This function is very similar to the SHOW/PRINT TRANS SUMMARY command in the *Transaction Data* menu, Page 62.

14.3 SHOW/PRINT MIDNIGHT

The MIDNIGHT function summarizes totals for a day. The following data is logged in the **SYSTEM2** journal at 12:00 AM - midnight:

- Daily transaction totals for each POS position of each PCT
- Daily product totals
- Daily transaction records

On the Midnight screen, when a POS position is installed, the pump number is indicated next to the POS number.

If one or more of the eight POS positions is *not* installed, the position is indicated with an **`X'**.

You can use **SHOW MIDNIGHT TOTALS** to display the data for any of the preceding eight days. When you enter the command, you are prompted to specify which day. For example,

1: JAN 27, 1994
2: JAN 28, 1994
3: JAN 29, 1994
4: JAN 30, 1994
5: JAN 31, 1994
6: FEB 1, 1994
7: FEB 2, 1994
8: FEB 3, 1994 -- ACTIVE
ENTER CHOICE:

Enter **[1]** -**[8]** to select the day, or **[ENTER]** to exit.

The current date is the **`ACTIVE'** date. Note that the data are stored in a "wrap-around" buffer. This means that as new data are recorded, old data are erased. In the above list, when data for February 4 is recorded, data for January 27 will no longer be available for display.

14.4 SHOW/PRINT DAY

The **SHOW DAY** or **PRINT DAY** commands display or print the following information for the specified day:

- Amount of each product dispensed
- Number of transactions
- Grand total of product dispensed
- Total dollar amount
- Dollar value of average transaction for the specified day.

14.5 SHOW/PRINT SHIFT

SYSTEM2 can keep track of transactions on a "per shift" basis. This allows you to match transaction data to employee times.

The **SHOW SHIFT** or **PRINT SHIFT** commands displays or prints the following information for the current shift:

- Starting time
- Amount of each product dispensed
- Number of transactions
- Grand total of product dispensed
- Total dollar value
- Dollar value of average transaction.

Change Shifts. Along with the transaction data, you are asked if you want to change shifts now. Press **[Y]** if you want to begin a new shift.

14.6 SHOW/PRINT/CLEAR PUMP #...TOTALS

These commands manipulate the totals for a specified pump and its totalizer value. The **CLEAR PUMP** command is privileged; the **SHOW PUMP** and **PRINT PUMP** commands are not.

The following prompts appear when you want to show or print pump totals:

```
ENTER PUMP: X
** PUMP X TOTALS **

TOTALS:       0.0
TOTALIZER:    0.0
```

14.7 SHOW/PRINT/CLEAR PCT #...TOTALS

These commands manipulate totals and totalizer values for all the pumps connected to the specified PCT. The **CLEAR PCT TOTAL** command is privileged; the **SHOW PCT TOTAL** and **PRINT PCT TOTAL** commands are not.

A PCT number must be specified for any of the commands. The following is a typical display after issuing a **SHOW PCT 1 TOTAL** command:

```
** SHOW PCT 1 TOTALS **

PUMP 1
 TOTALS:      0.0
 TOTALIZER:   0.0

PUMP 2
 TOTALS:      0.0
 TOTALIZER:   0.0
```

Non-installed PCT positions are not shown.

14.8 SHOW/PRINT FUELTYPE #...TOTALS

The **SHOW FUELTYPE TOTALS** and **PRINT FUELTYPE TOTALS** commands total all pumps of the same type of fuel. For example, you could use this command to see how much midgrade unleaded was dispensed from all pumps in a station.

The following prompts appear after issuing a **SHOW FUELTYPE 2 TOTAL** command:

```
PREMIUM   QTY:  0.0 GALLON
```

14.9 SHOW/PRINT/SET TANK (#...)

The **SHOW TANK** and **PRINT TANK** commands (not privileged) display or print the following for each programmed tank:

- Tank numbers
- Fueltypes
- Current quantities
- Low-level alarm quantities

The **SET TANK** command (privileged) lets you set the amount that is in a tank, and the level at which a "LOW TANK" alarm is activated.

15.0 Journal Printer Menu

From the MAIN menu, press **[J]**

```
---------------
JOURNAL PRINTER
-----------------------------------------
A: SHOW           A: JOURNAL PRINTER
B: PRINT
C: SET
-----------------------------------------
C: LOCK           B: PRINTER
D: UNLOCK
-----------------------------------------

^ENTER COMMAND    ^ENTER OPTION
```

-- ENABLE AUTH ON JOURNAL ERROR (Y/N)

15.1 SHOW/PRINT/SET JOURNAL PRINTER

An external printer can be connected to the PRINTER port on the back of the FSC to make a hard copy of all transaction data, providing added protection against data loss.

The journal printer records the transaction, pump and product numbers, the date and time, the first card number, the product quantity and dollar total.

The SHOW JOURNAL and **PRINT JOURNAL** commands display current printer configuration. Use the privileged **SET JOURNAL** command to specify the system will operate with an external printer. If so, you can also specify which of the following items will be printed:

- Account Name, Driver, Vehicle names. Odometer entry. Miscellaneous entry.
- Account number and second card.

The following is the result of a **SET JOURNAL** command (answering **[Y]** to all prompts):

OFFICE JOURNAL (Y/N) Y
SET JOURNAL PRINTER OPTIONS (Y/N) Y
PRINT:
ACCOUNT, DRIVER, VEHICLE, ODOM, and MISC (Y/N)
ACCOUNT #, CARD 2 (Y/N)
JOURNAL ERROR OPTION (Y/N)

The **JOURNAL ERROR OPTION** specifies if the system should authorize fueling when the printer is not operating.

The printer may "block" if an error, such as a paper outage, occurs. After fixing the error, unblock the communication with the **SET PRINTER** command.

15.2 LOCK/UNLOCK PRINTER

The **LOCK** command lets you turn OFF the logging function for the printer, useful for when multiple **PRINT** commands are executed.

If you want to print several items (for example, several types of transaction data) you can keep the printouts together by issuing the **LOCK PRINTER** command. No "incoming" items will be printed until you turn OFF the LOCK.

The **UNLOCK PRINTER** command returns the printer to its normal logging function. Any transactions that were locked out are printed when the printer is unlocked.

If no command is generated for 10 minutes while the printer is locked, the system exits the privileged mode and unlocks the printer.

Notes:

Notes:

Appendix A - Setup Worksheet

SYSTEM TIMES *(Page 27)*

Forward: _____ Backward: _____
System On: _____ System Off: _____
Receipts Only: _____ Time Adjust: _____
Light On: _____ Light Off: _____

SYSTEM DEVICES *(Page 29)*

FIT Setup

FIT #1 Issue receipts? yes no
Limit for receiving a receipt (0..99) _____
Enable keyboard access? yes no
PCTs to shut off on E-stop 1, 2, 3, 4
Valid pump numbers __ __ __ __ __ __ __ __

FIT #2 Issue receipts? yes no
Limit for receiving a receipt (0..99) _____
Enable keyboard access yes no
PCTs to shut off on E-stop 1, 2, 3, 4
Valid pump numbers: __ __ __ __ __ __ __ __

FIT #3 Issue receipts? yes no
Limit for receiving a receipt (0..99) _____
Enable keyboard access? yes no
PCTs to shut off on E-stop 1, 2, 3, 4
Valid pump numbers: __ __ __ __ __ __ __ __

FIT #4 Issue receipts? yes no
Limit for receiving a receipt (0..99) _____
Enable keyboard access? yes no
PCTs to shut off on E-stop 1, 2, 3, 4
Valid pump numbers: __ __ __ __ __ __ __ __

Installed FITs

FIT #1 FIT #2 FIT #3 FIT #4

PCT Setup

There are up to four PCTs in a **SYSTEM2**, each PCT controlling 8 positions. Copy this page and the next as needed. Circle the appropriate PCT and position numbers.

Note that most PCT configurations do *not* require *all* of this information.

PCT Number	**1**	**2**	**3**	**4**
POSITION NUMBER	**1**	**2**	**3**	**4**
Pump Number				
Pulses / Unit				
Max Fuel/Transaction				
Sentry Feature				
Max Time Fuel				
Max Time Handle				
Max Time 1st Pulse				
Max Time Between Pulses				
POSITION NUMBER	**5**	**6**	**7**	**8**
Pump Number				
Pulse / Unit				
Max Fuel/Transaction				
Sentry Feature				
Max Time Fuel				
Max Time Handle				
Max Time 1st Pulse				
Max Time between Pulses				

PCT Number	**1**	**2**	**3**	**4**
POSITION NUMBER	**1 / 5**	**2 / 6**	**3 / 7**	**4 / 8**
Fueltype Code #				
Fueling Tank				
Clear Pump Totals				
Totalizer Value				

Installed PCT positions:

PCT #1	POSITION #	1	2	3	4	5	6	7	8
PCT #2	POSITION #	1	2	3	4	5	6	7	8
PCT #3	POSITION #	1	2	3	4	5	6	7	8
PCT #4	POSITION #	1	2	3	4	5	6	7	8

Installed PCTs:

PCT #1 PCT #2 PCT #3 PCT #4

CUSTOMER MESSAGES *(Page 34)*

Language One

Message #	Prompt
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____
9	_____
10	_____
11	_____
12	_____
13	_____
14	_____
15	_____
16	_____
17	_____
18	_____
19	_____
20	_____
21	_____
22	_____
23	_____
24	_____
25	_____

26 _____

27 _____

28 _____

29 _____

30 _____

31 _____

32 _____

33 _____

34 _____

35 _____

36 _____

37 _____

38 _____

39 _____

40 _____

41 _____

42 _____

43 _____

44 _____

45 _____

46 _____

47 _____

48 _____

49 _____

50 _____

51 _____

52 _____

Language Two

Message #	Prompt
1	_____
2	_____
3	_____
4	_____
5	_____
6	_____
7	_____
8	_____
9	_____
10	_____
11	_____
12	_____
13	_____
14	_____
15	_____
16	_____
17	_____
18	_____
19	_____
20	_____
21	_____
22	_____
23	_____
24	_____
25	_____

26 _____

27 _____

28 _____

29 _____

30 _____

31 _____

32 _____

33 _____

34 _____

35 _____

36 _____

37 _____

38 _____

39 _____

40 _____

41 _____

42 _____

43 _____

44 _____

45 _____

46 _____

47 _____

48 _____

49 _____

50 _____

51 _____

52 _____

Keyboard Messages

Language One		
Key	Message	Default Function
1		*YES*
2		*NO*
Language Two		
Key	Message	Default Function
1		*YES*
2		*NO*

Receipt Header

	Language ONE Entry	**Language TWO Entry**	**Color**
Line 1:			RED BLACK
Line 2:			RED BLACK
Line 3:			RED BLACK
Line 4:			RED BLACK

Receipt Trailer

	Language ONE Entry	**Language TWO Entry**	**Color**
Line 1:			RED BLACK
Line 2:			RED BLACK
Line 3:			RED BLACK
Line 4:			RED BLACK

Receipt Body

	Language ONE Entry	**Language TWO Entry**	**Receipt Code**
Line 1:			
Line 2:			
Line 3:			
Line 4:			
Line 5:			
Line 6:			
Line 7:			
Line 8:			
Line 9:			
Line 10:			
Line 11:			
Line 12:			
Line 13:			
Line 14:			
Line 15:			

Bonus Points

ONE POINT PER _____ CENTS			
	Language ONE Entry	**Language TWO Entry**	**Color**
Line 1:			RED BLACK
Line 2:			RED BLACK
Line 3:			RED BLACK
Line 4:			RED BLACK

SYSTEM PARAMETERS *(Page 49)*

Site ID __ __ __ __ __ __ __ __ __ __ __ __ __ __

Fueltypes

Type #	Fueling Unit	Price Per Unit	Product Name
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

Fueling Units

Code #	Label
1	
2	
3	

Passwords

Main: _____ Modem: _____ Show: _____

Dual Language ENABLED DISABLED

RESTRICTIONS *(Page 54, 57)*

Pump Restriction

Restriction No.	Pumps Restricted:
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Quantity Restriction

Code No.	Max. Qty.	Code No.	Max. Qty
1		9	
2		10	
3		11	
4		12	
5		13	
6		14	
7		15	
8			

CARDS *(Page 58)*

Choice #1 Size Code: _____ Number of Transactions: _____

Size Code: _____ Number of Messages: _____

Choice #2

Odometer Entry:		[1]	[2]	[3]*
Miscellaneous Entry:	[1]	[2]	[3]	
PIN Entry:		[1]	[2]	[3]

* *1 = DISABLE all 2 = ENABLE all 3 = Determine by Card*

Choice #3 Keyboard Access Type: SINGLE DRIVER VEHICLE

Choice #4 Code Number Dates:

1:	6:	11:
2:	7:	12:
3:	8:	13:
4:	9:	14:
5:	10:	15:

TRANSACTION DATA *(Page 61)*

Enable Wraparound	yes	no
Log Unauthorized Transactions	yes	no
Display fields		
Account, Driver, Vehicle	yes	no
Date & Time	yes	no
Transaction #	_____	
Card #1	yes	no
Card #2	yes	no
Fueltype	yes	no
Quantity	yes	no
Price	yes	no
Total	yes	no
Odometer	yes	no
Miles per unit	yes	no
Miscellaneous	yes	no
Receipt Status	yes	no
Account #	yes	no

SYSTEM TOTALS *(Page 64)*

Tank Number	Fueltype	Current Quantity	Low Level Alert at
1			
2			
3			
4			
5			
6			
7			
8			

JOURNAL PRINTER *(Page 67)*

Print card 2 number	yes	no
Print card name (account, driver, vehicle)	yes	no
Print odometer, miscellaneous	yes	no
Allow fueling on journal error	yes	no

Appendix B - Memory Levels & Allocations

The following table shows the maximum number of transactions and cards or keys available with the standard and optional levels of RAM in your System 2. The memory level is displayed or set with the **SHOW RAM** or **SET RAM** commands in the System Parameters menu (Page 49).

MEMORY SIZE	NUMBER OF TRANSACTIONS	APPROX. # OF CARDS/KEYS
Level 1 (256 Kb)	100	1,600,000
	1000	920,000
	2000	150,000
Level 2 (512 Kb)	100	3,700,000
	2000	2,225,000
	4000	700,000
Level 3 (1 Mb)	100	7,900,000
	5000	4,100,000
	7500	2,200,000
	10,000	300,000
Level 4 (2 Mb)	100	16,000,000
	5000	12,500,000
	10,000	8,700,000
	20,000	1,000,000

Appendix C - Modem Use

C.1 INTRODUCTION

SYSTEM2 can be interrogated and programmed remotely over conventional telephone lines using a pair of modems. The "local" modem is at the **SYSTEM2** site; the "remote" modem is a remote terminal or computer.

The Data Carrier Detect ("DCD") is an output from the modem which **SYSTEM2** uses to know when a call has been received.

The Data Terminal Ready ("DTR") is an output from **SYSTEM2** which allows the modem to answer.

The PC Logic modem (available from **Petro Vend**) requires a PC in order to be configured.

C.2 LOCAL MODEM CONFIGURATION

The modem connected to the SYSTEM2 must have an "answer only" configuration.

The following parameters are required for ANY local modem. The PC Logic commands to enter these parameters are shown (these commands are only for the PC Logic modem).

Parameter	PC Logic Command
Answers on 1st Ring	**ATS0=1**
Monitors Data Carrier Detect	**AT&C1**
Result codes NOT returned	**ATQ1**
Resets when Data Terminal Ready is turned OFF	**AT&D2**

After entering the PC Logic commands listed above, enter **`AT&W'** to store the configuration permanently. The default baud rate for the PC Logic modem is 2400.

C.3 REMOTE MODEM CONFIGURATION

You can use the command **`AT&F'** to load the factory configuration for the remote PC Logic modem. The default baud rate is 2400.

C.4 MODEM PASSWORD

The initial modem password is **`HELLO'**. To change the modem password, see *System Parameters* on Page 51.

Appendix D - External Computer Operation

This appendix describes the following:

- How to connect a computer to the System2
- How to retrieve transaction data from the **SYSTEM2** in computer format
- How to send configuration data to the **SYSTEM2** in computer format
- How to backup and restore card, account and configuration data for the **SYSTEM2**.

To interface with the **SYSTEM2** via a PC, you must run an emulation program in your PC. This program is explained later in this appendix.

D.1 CONNECTING A COMPUTER

If the distance between the FSC and PC is *less than 50 feet*, the FSC is considered directly connected to the PC. See *Direct Connection* section.

When the distance is *greater than 50 feet*, modems are required. See *Modem Connection* section.

CAUTION

BEFORE making any connections, be sure your computer and peripheral equipment (printer, converter, modem, etc.) are OFF.

D.1.1 Direct Connection

A four-conductor cable connects the **SYSTEM2** FSC to the PC. One end of the cable is terminated with a DIN connector, the other end has a 25-pin "D" connector.

- The DIN connector plugs into the TERMINAL socket on the rear of the FSC
- The 25-pin connector plugs into your PC, typically in the COM1 or COM2 serial port.

If the "gender" of the 25-pin connector on your computer is the same as that of the communication cable (for example, they are both female), you will have to purchase a "gender-bender" adaptor.

Refer to your PC instruction manual for more information on the serial ports - *not every 25-pin connector on the PC is a communications port*.

Some machines may only have a 9-pin serial port. If so, you will have to purchase an adaptor to convert the 25 pin plug to a 9-pin plug. Most electronic or computer supply stores carry these adapters.

If there is only one serial port on your machine, and it is already being used, you can purchase an additional Serial Card at most computer supply stores. Be sure to read your computer owner's manual prior to buying or installing a card.

Plug the PC power cord into a standard wall socket. You are ready to power up the PC and begin setting up the terminal emulation software.

D.1.2 Modem Connection

A modem must be used if you want to communicate with the system from any distance greater than 50 feet.

A Hayes-compatible modem must be used, because **SYSTEM2** uses Hayes® commands.

Most modems have four sockets, for the following functions:

- A 25-pin "D" socket for the PC
- An RJ11 socket (for TEL line)
- An RJ11 socket (for telephone)
- A POWER IN socket

The modem should have come with the cables you need to make the following connections. (If not, you can purchase what you need at most computer supply stores.)

1. Connect the 25-pin socket to the COM1 or COM2 serial port on the back of your computer.

2. Connect a phone cable from the modem RJ11 "LINE IN" jack to your facility telephone jack.

3. If you want the PC to share its line with a telephone, connect the telephone to the RJ11 modem "TEL" jack.

   You cannot use the telephone (for voice communication) and the modem simultaneously.

4. Plug the power adapter into its socket on the modem and into a standard 115 VAC wall socket.

D.2 TERMINAL EMULATION SOFTWARE

For a PC to communicate with **SYSTEM2**, you must run a terminal emulation program. **Petro Vend** strongly suggests you use PROCOMM® emulation software, made by DATASTORM TECHNOLOGIES, INC. Contact your Petro Vend distributor for details.

Read the manual for your Terminal Emulation software carefully. You will need to set the following values:

Baud Rate . . . . . Must match ***SYSTEM2***
Data Bits 7
COMM Port . . . . PC port being used
Parity . . . . . Even
Stop Bits 1

If you are using direct connection, you will need to set the software to "go local". If you are using a modem, you will need to set its program switches.

You will also need to enter the telephone number of the **SYSTEM2** site.

D.3 TRANSACTION DATA FORMAT

D.3.1 Description

The transaction data format is designed to be read by people, and includes a header with configuration data and labels for each included field. In the display format, the transmission of transaction records can be cued from the keyboard.

The header is described in a table on Page 87.

Computer formatted data eliminates these labels, substituting data checks, field codes and field separators. This format is meant to transfer transaction data to a computer data base.

The Field Codes are described on Page 87.

To pace the data stream, the transmission of each transaction record must be cued by a specific computer response.

To retrieve transaction data in the computer format, append the prefix **`SHOW'** and the suffix **`CF'** to one of the following commands (an example appears on the next page):

TRANSACTIONS
TRANSACTION ###
TRANSACTIONS WHERE DATE = mmm dd, yyyy
TRANSACTIONS WHERE DATE < mmm dd, yyyy
TRANSACTIONS WHERE DATE > mmm dd, yyyy
TRANSACTIONS WHERE TIME = hh:mm am/pm
TRANSACTIONS WHERE TIME < hh:mm am/pm
TRANSACTIONS WHERE TIME > hh:mm am/pm
TRANSACTIONS WHERE CARD = #
TRANSACTIONS WHERE VEHICLE = #
TRANSACTIONS WHERE ACCOUNT = #

The following command will call up transaction 123 in computer format:

SHOW TRANSACTIONS 123 CF

Search commands can be combined with **`AND'** in the computer format. For example:

SH TRANS WH DAT = JAN 1,1989 AND WH TIM > 5:00 PM CF

Transaction report functions are explained in more detail on Page 61.

When data is requested from **SYSTEM2** in the computer format, **SYSTEM2** first transmits the transaction header and the first transaction. This header *always* includes:

- Codes to indicate which transaction fields will be included in the transmitted record(s)
- a 2-digit checksum and a carriage return
- a line feed (**`|CR|LF|'**).

All transactions include the sequence number and Reason For Termination code(s). The fields are included as specified by the transaction field codes listed in the header. All items are separated by a slash (**`/'**).

The Reason For Termination codes - both for Granted and Denied transactions - are listed in the tables on Page 88 and Page 89.

Each record is terminated with **`|CR|LF|'**. The external computer responds with **`|CR|LF|'** to initiate the transmission of the next record.

The **SYSTEM2** will send records each time it receives **`|CR|LF|'** up to the last record. At the last record, the system sends **`//|CR|LF|'**.

If the computer session is terminated by the computer with an `X', **SYSTEM2** sends `\\|CR|LF|'.

If access was denied to a fueler, only the first four data fields are recorded (and can be transmitted) for that transaction.

The graphic below is an example of a transaction data retrieval in the computer format. Note that a data check was *not* included in the header.

The SHOW TRANSACTION command has been abbreviated to `SH TRANS`.

`|CR|LF|' A carriage return and a line feed.

`-' A "space pad." A transaction record is sent as one string.

For clarity, the example below shows line breaks between fields.

```
External Computer Output      SYSTEM2 Response
-------------------------------------------------------
------------
SH TRANS 123CF|CR|LF|         abcdefghijklmno/07|CR|LF|
                        123/I/TRUXCO---/SMITH----/VAN1----
-/

02221989/0711/0123/20001--------------/
                        60001--------------
/03/03/0025000/00100/

000002500/0066555/105/1234567890/1/1234/
                        11/|CR|LF|
|CR|LF|                       //|CR|LF|
```

TRANSACTION HEADER

Item	Format	Pad	Inclusion
Number of transactions	4 digits, left justified	zero	optional
Sum of quantities	9 digits, left justified	zero	optional
Transaction field codes	0 - 15 characters	none	always
Checksum	2 digits	none	always

TRANSACTION FIELD CODES

Code	Field	Format	Pad
a	Account/driver/vehicle	9 characters each	space
b	Date/time	8/4 digits: mmddyyyy/hhmm	zero
c	Transaction number	4 digits	zero
d	Card #1	19 digits, left justified	space
e	Card #2	19 digits, left justified	space
f	Fueltype	2 digits: 1 - 16	zero
g	Pump number	2 digits: 1 - 99 *or* 3 digits if hose number is specified	zero
h	Quantity	7 digits: ####.###, implied decimal	zero
i	Price	5 digits: ##.###, implied decimal	zero
j	Total	9 digits: #######.##, implied decimal	zero
k	Odometer	1 char, 6 digits: X######; `?' in 1st location indicates *un*reasonable entry, `0' indicates reasonable entry; all blanks if odometer entry *not* prompted	zero
l	MPG	3 spaces: mpg *not* available	zero
m	Miscellaneous	10 digits	space
n	Receipt status	1 digit: 1=issued; 0=*not* issued	none
o	Account number	4 spaces; account # *not* available	zero

REASON FOR TERMINATION CODES (AUTHORIZATION *GRANTED)*

Code	Reason	Cause	Possible Solution
C	Pump error, premature busy	*No suggestions*	
D	Pump error --reset quantity exceed	Pulses being received without current being sensed or handle switch detection.	Check PV268 DIP switch #6 for correct selection (current sense or handle switch). Check current: s/b 100 mA AC minimum.
E	No **`PUMP HANDLE BUSY'**	No current sense or handle switch detection after pump authorization.	Check PV268 DIP switch #6 for correct selection. Check current draw: s/b 100 mA AC minimum. Make sure handle timeout is long enough. Check wiring to PV270 relay board.
F	**No fueling pulses**	Current sensed or handle switch detected, but no pulses received from pulser.	Check PV268 DIP switch #1 for correct pulser type. Check pulser wiring. Check pump's First Pulse timer.
G	**Pump currently active**	*No suggestions*	
I	**Normal**	Good transaction.	May appear even for incomplete transaction if current sense threshold is too close to actual current draw. Contact Petro Vend Technical Support.
J	**Quantity limit exceeded**	Card, account or pump limit reached.	Check programming for card, account or pump
K	**Total transaction time exceeded**	Pump is programmed to dispense fuel only for a specific length of time.	Check "MAX TIME FOR FUELING" value, and adjust accordingly.
L	**Pulser error**	Only in flowswitch applications. Pulses not received within five seconds of flow switch activation.	Check pulser. Possible faulty flow switch.
M	**Emergency stop**	Emergency stop button was depressed during fueling.	If button was NOT pressed, check E-STOP button for short.
N	**Missing pulse detected**	Current sensed, pulses received, then fueler stops pumping. As long as pump is ON, Pulse Timer runs.	Lengthen the Pulse Timer duration, or hang the pump up.
O 01	**Communication errors**	Power interruption during fueling caused termination of transaction.	Check power source. Are noise filters installed in pump motors, solenoid valves, and contactors?
Z	**Manager activated**	*No suggestions*	

REASON FOR TERMINATION CODES (AUTHORIZATION *DENIED)*

Code	Reason	Cause	Possible Solution
b	**Bad PIN entry**	Wrong PIN entered three times.	Verify PIN assigned to card is correct. If yes, check the keypad with FIT test program.
c	**Bad odometer entry**	Fueler's card is set for odometer reasonability, and entry falls outside acceptable limits.	Re-enter odometer value. Change reasonability (see Section 11).
d	**Bad miscellaneous entry**	NOT USED	NOT USED
e	**User entry timeout**	Fueler did not enter data after inserting card.	Operator error, or possible keypad malfunction.
f	**Card # not in positive file**	Card not programmed in system.	Program the card into the system database.
g	**Card expired**	Card has expiration date assigned to it. This date has passed.	Assign new expiration date to card, or issue new card.
i	**Card invalidated**	Card has not been validated for use in this system.	Change validation status of card.
j	**Three bad PIN entries**	Fueler has entered incorrect PIN three times.	Verify PIN assigned to card is correct. If yes, check the keypad with FIT test program.
k	**No allocation**	Daily or monthly limit has been reached on card or account.	If daily, fueler must wait until midnight to reset daily totals. If monthly, new limits must be programmed or totals cleared.

D.3.2 Data Checksums

The checksum is a number included with data to ensure the integrity of the data.

Description

The checksum used by the **SYSTEM2** is a 2-digit number calculated by adding the decimal values of the ASCII characters in a string and truncating the sum.

An ASCII table appears on page 91.

For example, in the string **`/ABC'**, the decimal values for each character are: **`/'** = 47, **`A'** = 65, **`B'** = 66 and **`C'** = 67. Adding these numbers produces 245. Truncating the number in this case means removing all but the last two digits - for 245, this results in 45.

The checksum is included with transaction, card, and account records sent by the **SYSTEM2**. You can also checksum each record when using the **`RESTORE'** command.

As an example, the following transaction record has a checksum of 08.

123/I/123089/1130/000001234/08|CR|LF|

Note that when calculating the checksum for a record, you *must* include the slashes (**`/'**) in the calculation.

An example of a checksum in a **`RESTORE'** command is:

RESTORE STATION12345/abcdef/75|CR|LF|

The checksum is 75. Note that you *must* include the slash and the blank space (between **`RESTORE'** and **`STATION12345'** in the example above) in the checksum calculation.

Calculating a Checksum

The following BASIC program can be used to determine the checksum for a line of data:

```
10  CHKSUM% = 0
20  TRANSACTION$ = "LINE OF DATA 0123456789"
30  NUMCHARS% = LEN(TRANSACTION$)
40  FOR INDEX% = 1 TO NUMCHARS%
50  S I N G L E C H A R $ =MID$(TRANSACTION$,INDEX%,1)
60  CHKSUM% = CHKSUM% + ASC(SINGLECHAR$)
70  NEXT INDEX%
80  TEMP$ = STR$(CHKSUM%)
90  TEMP$ = RIGHT$(TEMP$,2)
100 PRINT TEMP$
110 END
```

DECIMAL VALUES OF ASCII CHARACTERS

Decimal Value	ASCII Character	Decimal Value	ASCII Character	Decimal Value	ASCII Character	Decimal Value	ASCII Character
032	(space)	056	8	080	P	104	h
033	!	057	9	081	Q	105	i
034	"	058	:	082	R	106	j
035	#	059	;	083	S	107	k
036	$	060	<	084	T	108	l
037	%	061	=	085	U	109	m
038	&	062	>	086	V	110	n
039	'	063	?	087	W	111	o
040	(	064	@	088	X	112	p
041	)	065	A	089	Y	113	q
042	*	066	B	090	Z	114	r
043	+	067	C	091	[	115	s
044	,	068	D	092	\	116	t
045	-	069	E	093	]	117	u
046	.	070	F	094	^	118	v
047	/	071	G	095	_	119	w
048	0	072	H	096	'	120	x
049	1	073	I	097	a	121	y
050	2	074	J	098	b	122	z
051	3	075	K	099	c	123	{
052	4	076	L	100	d	124	|
053	5	077	M	101	e	125	}
054	6	078	N	102	f	126	~
055	7	079	O	103	g		

D.3.3 Suppressing SYSTEM2 Prompts

The prefix **COMPUTER** can be placed before any command (*except* **PRINT** or **SHOW**) to suppress the usual **SYSTEM2** prompts and allow only a carriage return (`**|CR|**') or line feed (`**|LF|**') to be returned.

The `**P>**' prompt is returned after each command sequence has been *successfully* completed.

The following command ssuppresses prompts, and enables checksum (the ".." enables checksum):

COMPUTER/HELLO/HELLO/ ..

If the prompt is *not* returned when expected, a 'R' (for RETRY) is returned instead. To abort a command sequence, send a `**^C**' (ASCII 03). You may then re-issue the command.

D.3.4 BACKUP & RESTORE Commands

Backing up the card validation data allows you to safeguard this information and to minimize system downtime when modifying or repairing a **SYSTEM2**. You can also backup one and restore the data to another **SYSTEM2** systems are to have the same data base.

The `**BACKUP**' and `**RESTORE**' commands must be included as part of a computer program that can format, store and transmit the raw computer data produced by the **SYSTEM2**.

The ***Phoenix*** or ***Phoenix Plus*** software package from **Petro Vend, Inc.** provides all the know-how you need to backup and restore card data quickly and easily using an IBM®-compatible personal computer. ***Phoenix*** is available from your local **Petro Vend** distributor.

BACKUP/BACKUP Card Commands

These *privileged* commands transmit card and account data from the **SYSTEM2** data bbbase to an external computer.

From an external computer, the **BACKUP** commands request SYSTEM2 to transmit site id, card and account field code(s), checksum, carriage return and a line feed (`**|CR|LF|**'), all separated by a slash (`***/***').

The records themselves are then sent following each `**|CR|LF|**' sent by the external computer. After the last record, the **SYSTEM2** sends `***//|CR|LF|***'. Checksum is explained on Page 90. The card and account field codes are listed in tables on Page 87.

- If NO card is specified, backup starts transmission at the first card/account record
- If a card number is specified, the transmission starts at the specified record. Because the records are sorted by number, this command allows you to backup a latter portion of the file.

Card and account records are sorted *only* by number; that is, account 2222 would be between card 1111 and card 3333. The **BACKUP** commands back up *both* record types.

There is no command to specify only card or only account. The illustration on Page 86 illustrates a typical `**BACKUP**' communication sequence.

The following is an example of the information exchanged with the `**BACKUP**' command.

```
Computer Output      SYSTEM2
Response
-----------------------------------
--------
|CR|LF|              P>
BACKUP|CR|LF|
STATION12345/abcdefghijklmn/44|CR|LF
|
|CR|LF|
1000400000000000000/00100001/1234/

02021990/00000809/001000/000100/
              --5903/0014060/02/00/
              01/RIKARD---/54|CR|LF|
|CR|LF|              //|CR|LF|
```

In this example, `**STATION12345**' is the site ID and `**44**' is the checksum. The `**-**' indicates a "space pad." Card and account records are sent as single strings. For clarity, the example above shows line breaks between fields.

RESTORE site id (/fields) (/checksum)

This *privileged* command loads card and account information from an external computer to the **SYSTEM2** data base.

The SITE ID, CARD or ACCOUNT numbers (field "a") and RECORD TYPES (field "b") must be specified.

You may specify any additional field codes you wish to restore (see Restoring Fields below). You may also include a checksum for the command line and/or the data records.

The field codes are listed on Page 87. Checksum is explained on Page 90.

IMPORTANT

Field codes must be specified with lower case letters. The command RESTORE and any letters in the site ID must be specified with upper case letters.

A typical **`RESTORE'** communication sequence appears on Page 87. The following sample information exchanged with the **`RESTORE'** command.

```
Computer Output       SYSTEM2 Response
-------------------------------------
--------
|CR|LF|
              P>
RESTORE STATION12345/abcdefghijklmn/
44|CR|LF|
       |CR|LF|
1000400000000000000/00100001/1234/
02021990/00000809/001000/000100/--5903
/
0014060/02/00/01/RIKARD---/54|CR|LF|
       |CR|LF|
//|CR|LF|
       P>
```

The `|CR|LF|' indicates a carriage return and a line feed. The `-' indicates a "space pad." A card or account record must be sent as one string. For clarity, the example above shows line breaks between fields.

Restoring Fields

The **SYSTEM2** allocates space in its data base when it receives the field codes. You can restore a different number of fields than were in the data base when it was backed up.

For example, if a field was accidentally omitted during configuration, you can add that field without losing any card or account data.

First, back up the current card or account data. Then, use the **SET CARD BUFFER** command to include all the old and new fields.

This destroys the old data!

Finally, restore the card or account data, specifying the original fields *plus* the new field(s). The new fields can be filled with blanks or actual data.

Similarly, you can restore fewer fields - this increases the number of transactions or card and account records to be retained by the **SYSTEM2**.

Backing up the **SYSTEM2** is like taking a snapshot of the data base. When data is restored, **SYSTEM2** returns to exactly the same state as when backed up.

Frequent data base backups reduce the need to update any specific fields (e.g. mileage) in the data base when you use the **RESTORE** command.

UPDATE site id (/fields) (/checksum)

This *privileged* command modifies existing card or account records in the **SYSTEM2**.

SITE ID and CARD # must be specified for this command; all other field changes are optional. A field *must* be present in the original record to be updated. Checksum data can be sent if desired.

The sequence for the **UPDATE** command is similar to that of **RESTORE** (see Page 87).

The following is an example of changing the PIN number (field "i") for card 1000400000000000000 with the command.

```
Computer Output       SYSTEM2 Response
-------------------------------------
--------
UPDATE STATION12345/ai/80|CR|LF|
       |CR|LF|
1000400000000000000/--6666/91|CR|LF|
       |CR|LF|
//|CR|LF|
       P>
```

IMPORTANT

The message `SYSTEM DOWN' is shown on the FIT display while backing up or restoring configuration data. Normal fueling access is *not* allowed while this message is displayed.

The **`|CR|LF|'** indicates a carriage return and a line feed. The **`-'** indicates a "space pad." A card or account record must be sent as one string.

SYSBACKUP Command

When this command is executed, **SYSTEM2** transmits the configuration data and the version number of the system.

You CANNOT back up configuration data while a transaction in is progress.

SYSRESTORE ####(#)/<checksum> Command

When this command is invoked, **SYSTEM2** does the following:

- tests the restored FSC software version for compatibility
- clears the card buffer
- clears all transactions
- restores configuration data
- restarts all tasks
- optionally changes the size of the system memory (RAM)

SYSRESTORE requires the FSC version number and checksum be specified. Version number must be the same for *both* the system that was backed up and the system that will be restored (the letter after the version number can be ignored for this command).

The FSC version number is printed on the cover of this manual; it can also be displayed using the **SHOW SYSTEM** command (Page 49).

The decimal point is *not* included.

For example, if a **SYSTEM2** with FSC software version 21.01E and standard RAM memory is backed up, the command **SYSRESTORE 2101** can be used to reconfigure the same system or another system with the same FSC version number and the same size memory.

Differing RAM Size

SYSRESTORE also lets you restore differing size system memory (RAM) by specifying the size code (#) for the system to be restored. RAM size code is explained on Page 53.

The memory size specified with the **SYSRESTORE** command MUST match the actual memory size of the **SYSTEM2** being restored!

If the specified memory is larger than the system's memory, **SYSTEM2** locks up and must be cold started (the power and battery turned OFF and then ON). If the specified memory is smaller than the system's memory, **SYSTEM2** will *not* be able to access the additional memory.

The **SYSBACKUP** command takes a "snapshot" of ***SYSTEM2*** data. Any configuration data that may have been changed since the last backup - time, date, tank levels, etc. - must be re-entered after executing the **SYSRESTORE** command.

No pumps can be active at the time of a **SYSBACKUP** *or* **SYSRESTORE** command.

Appendix E - Troubleshooting

E.1 COMMON PROBLEMS AND POSSIBLE SOLUTIONS

Problem	Possible Solution
No FIT display messages	• Adjust "display viewing angle" potentiometer (on top of the display PC board).
*`**FAULTY PUMP'** message at FIT*	• Three "zero-quantity" transactions: re-install pump with **`INSTALL PCT # POSITION #'** command • Bad pump pulser: replace pulser
*`**RESET QUANTITY EXCEEDED'** message at FIT*	• Current sensor/pump handle selector switch in wrong position: change Switch #1 on PV-268 board
*`**SYSTEM DOWN'** message at FIT*	• FIT *not* installed: install FIT • Petro-Net wiring problem: check, repair wiring • Possible FIT board malfunction: run **COMM** test to check board; replace board if necessary
`SYSTEM DOWN' at *all* FITs	• Possible FIT board malfunction(s): run **COMM** test for each FIT board; replace board(s) if necessary • Possible FSC board malfunction; if all FIT board pass **COMM** test, replace FSC board
`INCORRECT CARD' message at FIT	• Incorrect network number encoded on card(s); replace card(s) • Incorrect network number programmed in FIT EPROM: replace EPROM

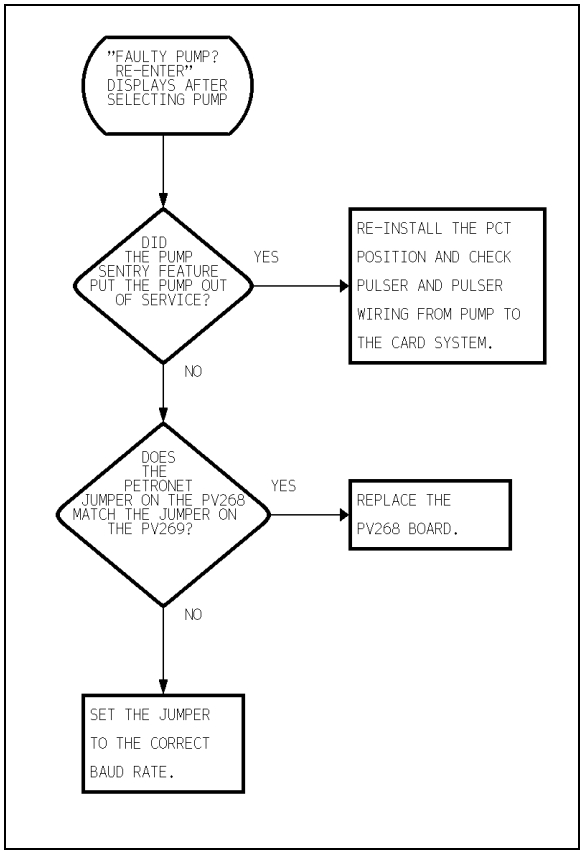
Problem	**Possible Solution**
*`**SYSTEM FULL'** message at FIT*	• Printer error: clear error • Transaction buffer filled: clear buffer • Buffer wrap-around *not* enabled: enable wrap-around
*`**MEMORY ERROR'** message at terminal*	• Expanded memory failure: battery switch *not on* during system power failure • Battery failure: replace battery • Expanded Memory failure: replace FSC board
Pulser not counting pulses	• Active/passive pulser selector switch set incorrectly: change Switch #1 on PV-268 board
Newly programmed messages or pump parameters not working	• Changes were not downloaded: use **`DOWNLOAD** command
Printer not printing transactions	• Communications blocked due to printer error: unblock with **`SET JOURNAL'** command; printer locked: unlock printer with **`UNLOCK'** command
Printer Error LED flashing	• Printer error code: 1 flash - paper jam 2 flashes - paper low (or out) 3 flashes - printer cutter jam
Black square on FIT display after card inserted	• No display message for second language has been programmed: program message

E.2 TROUBLESHOOTING FLOWCHARTS

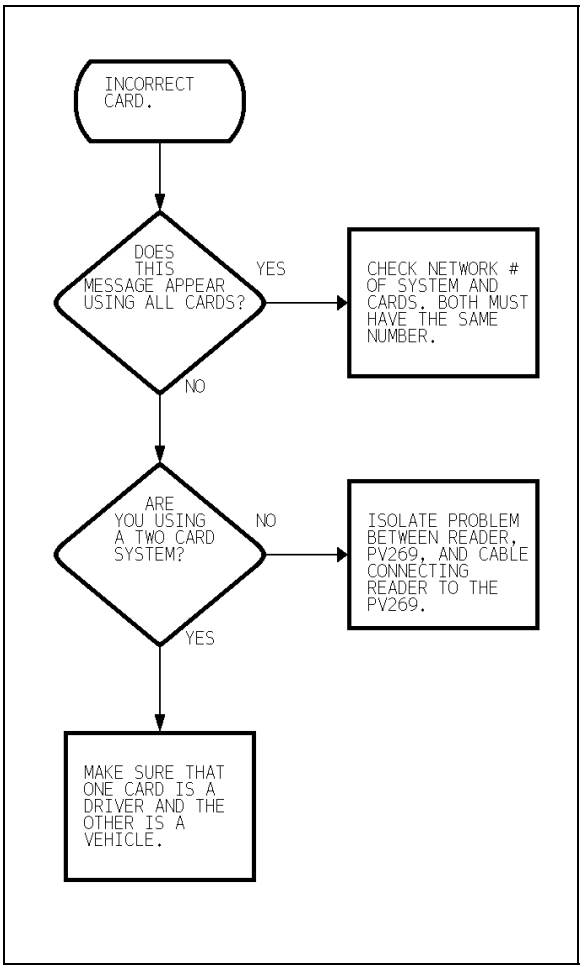
The following flowcharts give you some advice on what to do when the following messages appear on the FIT: FAULTY PUMP? RE-ENTER, INCORRECT READING, INCORRECT CARD, INVALID PUMP. RE-ENTER, PUMP HANDLE? RE-ENTER, and SYSTEM DOWN.

In addition to the FIT messages, three troubleshooting charts give you advice when there's (1) No quantity shown on the transaction receipts, (2) There is no communication between the FSC and the PC, and (3) A modem doesn't answer the System2.

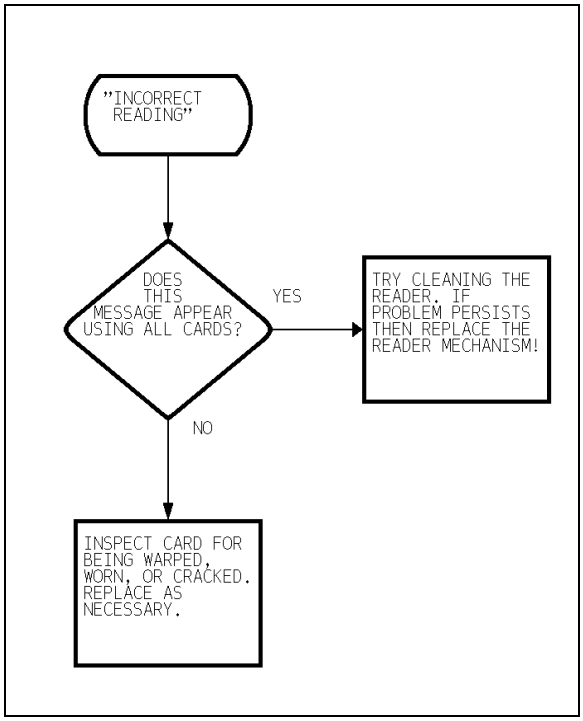
"FAULTY PUMP RE-ENTER" MESSAGE



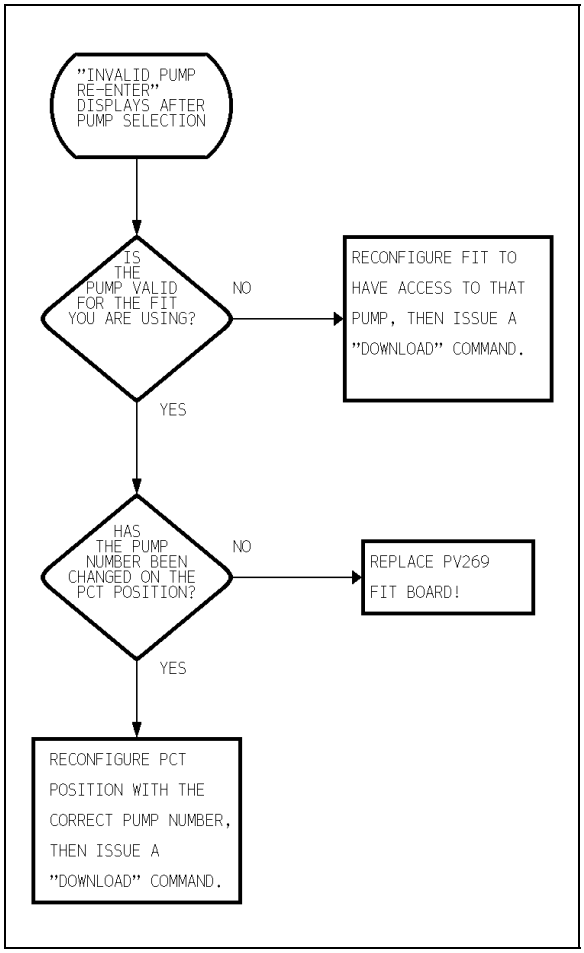
"INCORRECT CARD" MESSAGE



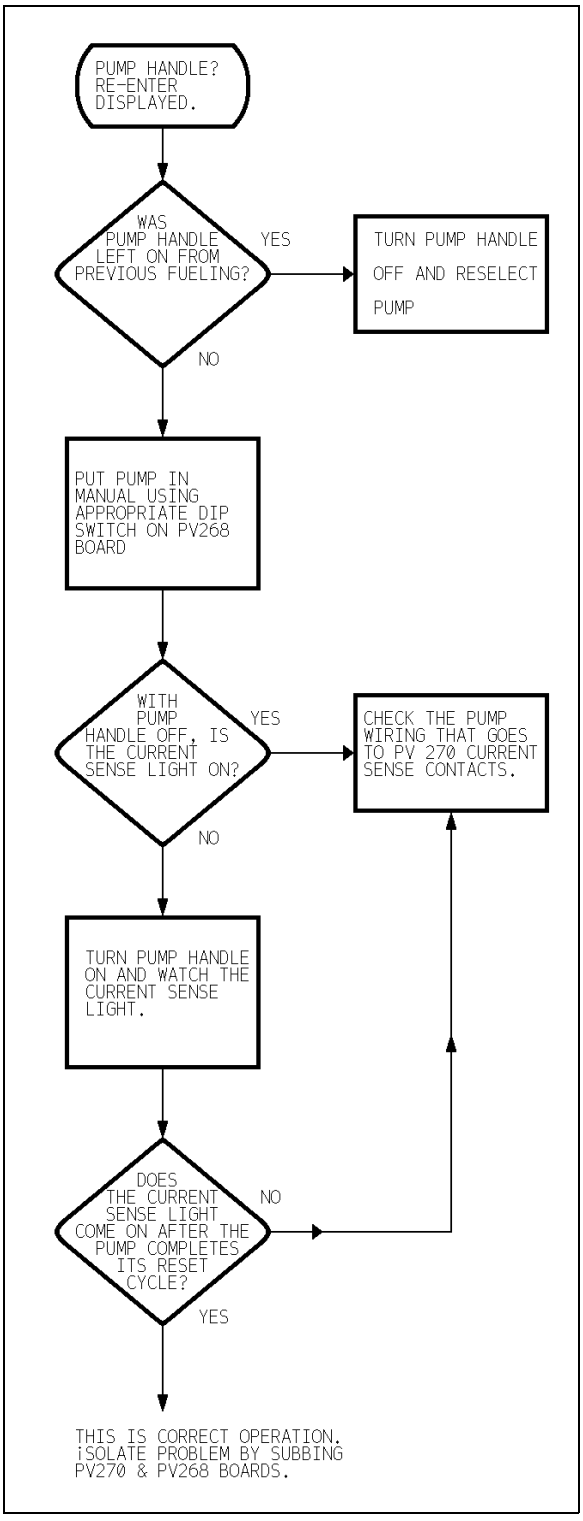
“INCORRECT READING” MESSAGE



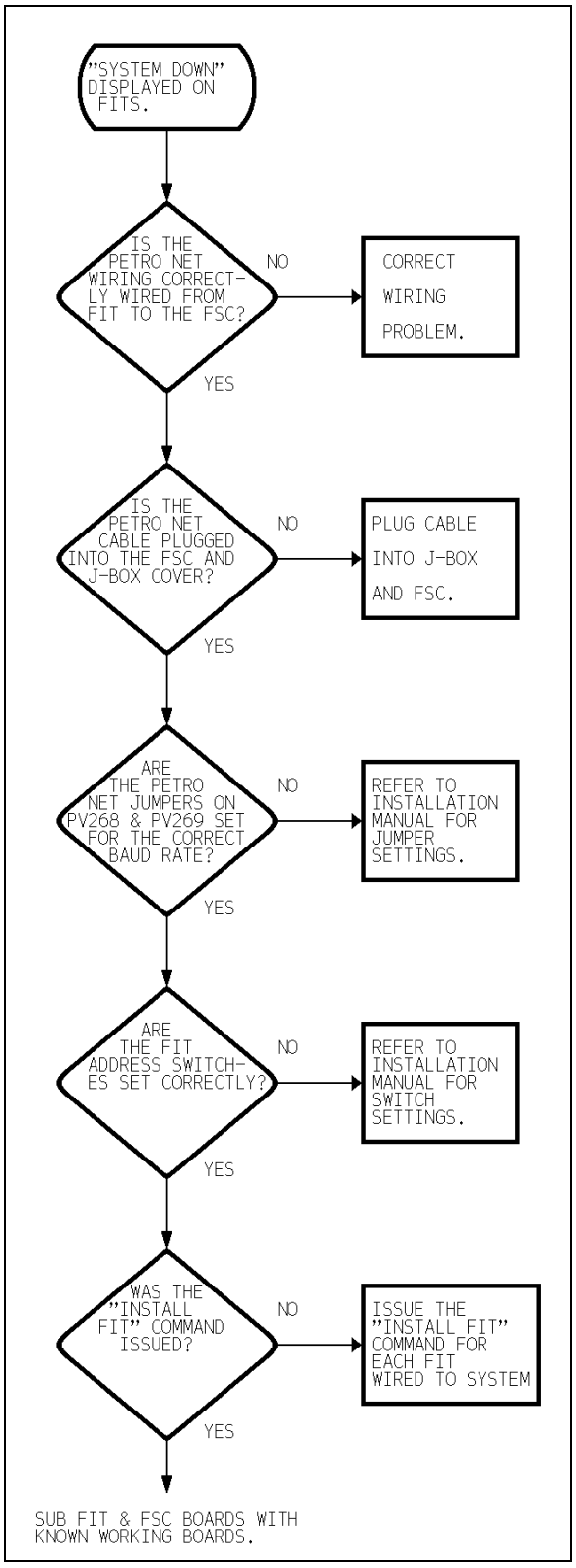
“INVALID PUMP - REENTER” MESSAGE



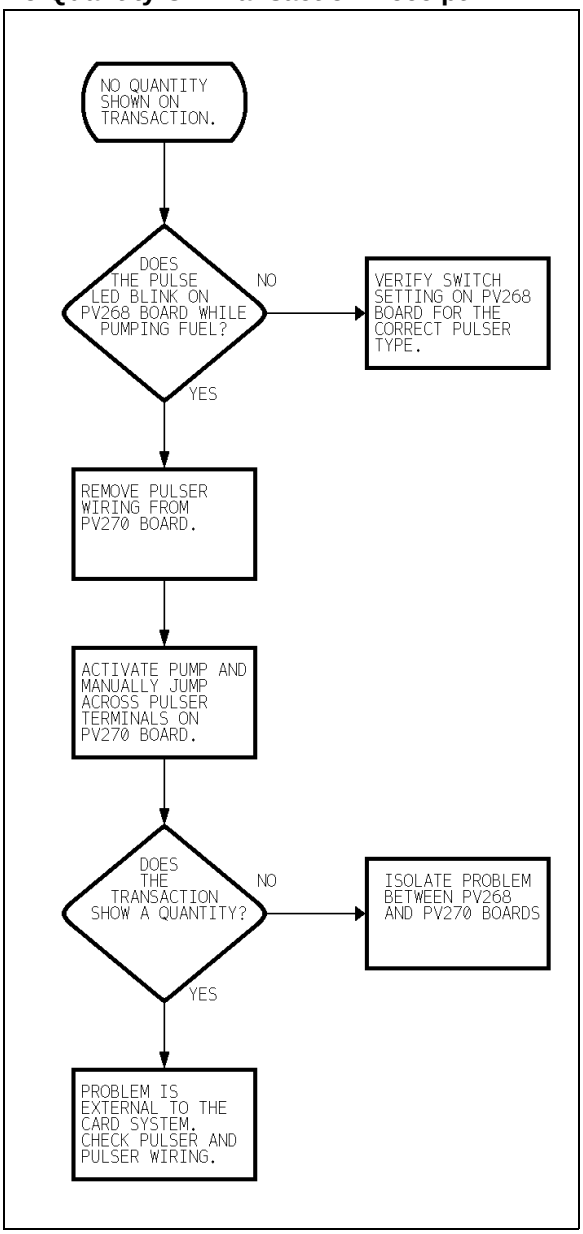
“PUMP HANDLE - REENTER” MESSAGE



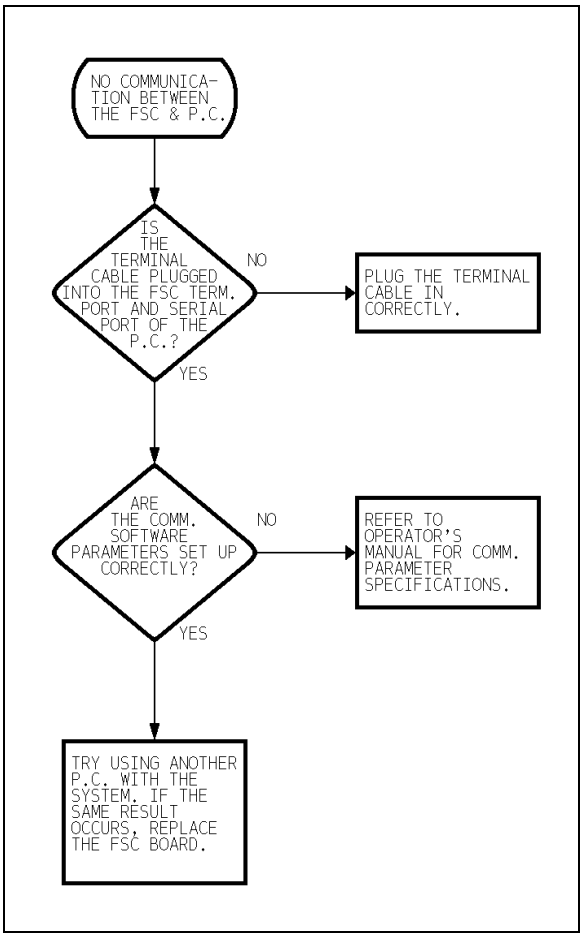
“SYSTEM DOWN” MESSAGE



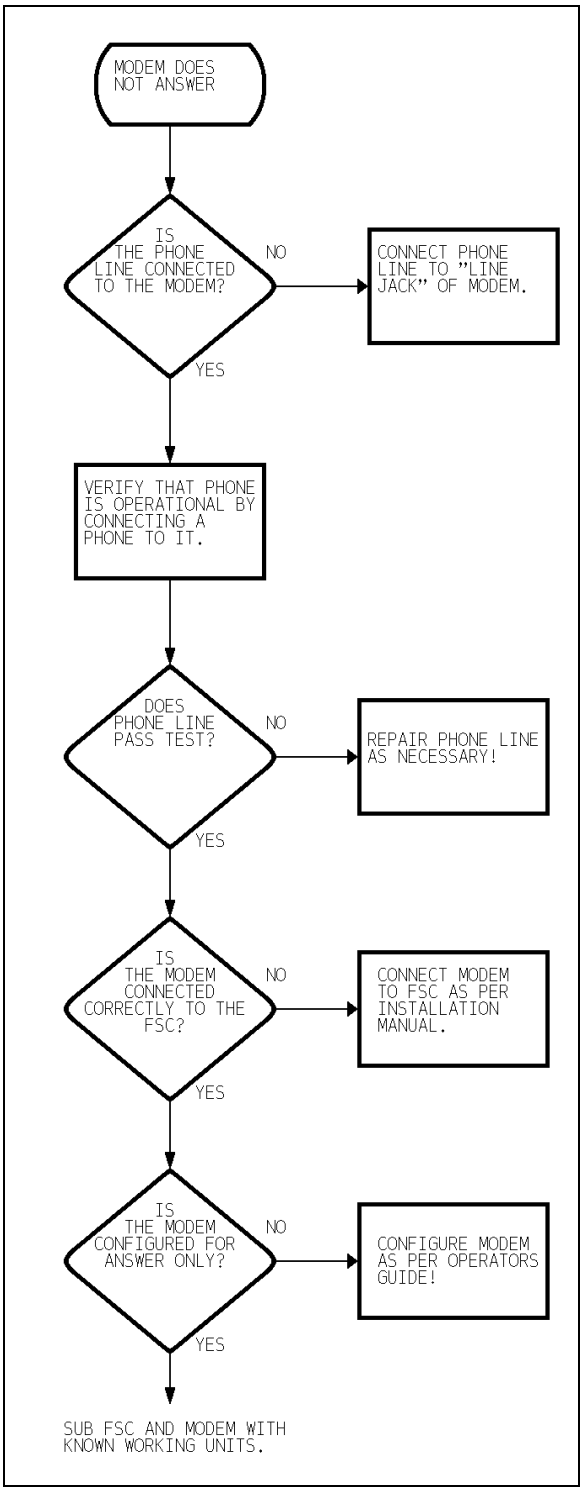
No Quantity On Transaction Receipt



No Communication Between FSC & Terminal



Modem Does Not Answer



Appendix F - Receipt Printer & Card Reader Maintenance

The Fuel Island Terminal may have a receipt printer installed to provide customers with receipts. The FIT can also have one or two magnetic or optical card readers.

This Appendix describes how to replace the printer paper roll and the ribbon cartridge, and how to clean the card reader.

For additional information on the printer, its control board, status LEDs, and switches, refer to the *SYSTEM2 Installation Manual*.

F.1 RECEIPT PRINTER MAINTENANCE

F.1.1 Paper Feed/Cut Switch

The paper feed/cut switch has two functions. When you press and hold the switch, paper is advanced through the printer as long as the switch is pressed. When you press and immediately release the switch, the paper cutter is activated.

WARNING!

Use caution when near the paper cutter. Do not use your fingers to remove paper near the cutter.

F.1.2 Replacing Paper

Power to the FIT must be ON to remove and reload paper.

To remove the low paper roll, lift the paper roll up from the paper holder and cut the paper away from the printing mechanism. Note where the paper enters the mechanism. This is where you will feed the new paper.

Press and hold the paper feed/cut switch for several seconds to advance the remaining paper through the printing mechanism.

Remove the spindle from the old roll and place it into the new roll. Slide the new paper roll back onto the paper holder.

Orient the new roll so that the paper feeds to the printer from the BOTTOM and BACK of the roll (see Figure F1).

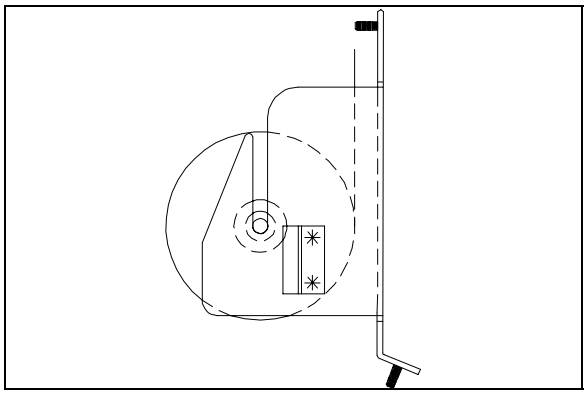


Figure F1 - Paper Roll Orientation

Be careful not to damage the "paper out" sensor mounted on the right side of the paper holder. Also, DO NOT BEND THE PAPER GUIDES.

Feed the end of the paper into the printer. Press and hold the paper FEED/CUT switch to move the paper through the printer. The paper should curve *down* as it feeds through the assembly. Press the paper FEED/CUT switch to cut off any excess paper.

F.1.3 Ribbon Replacement

Power to the FIT must be ON. Press and hold the paper feed/cut switch to advance the paper about two inches (5 cm) through the printing mechanism. This prevents the paper from slipping out of the printing mechanism when you move the cutter assembly.

The cutter assembly is attached to the printer mechanism by hinges. (Note the illustration on the printer.) Gently swing the cutter assembly toward you to reveal the ribbon cartridge underneath.

The word "LIFT" and an arrow indicating which

side are inscribed on the printer cartridge. Gently pull on this side first to release the cartridge. Remove the cartridge.

Before installing the new printer cartridge, tighten its ribbon with the adjustment wheel on the cartridge. The ribbon should be as tight as possible in order to fit into the narrow slot of the printer.

Gently snap the new ribbon cartridge into place. Be sure that the ribbon is properly positioned in its slot.

If the ribbon is noticeably visible after you install the cartridge, remove the cartridge and tighten the ribbon.

Swing the cutter mechanism back into place.

F.1.4 Testing the Printer

To test the printer:

1. Press *both* the paper feed/cut switch and the printer reset switch *simultaneously*.

2. Release the reset switch and hold the paper feed/cut switch until the printing begins.

   When the printer is properly installed and functioning, it prints a message with: (1) current printer software version, (2) samples of all font sizes in both red and black print, (3) format selections for DIP switch position #1, and (4) selected currency symbol.

When the test is completed, the receipt is cut.

The printer RESET switch resets the printer. If the printer jams (indicated by CR2 flashing), press the printer reset button after correcting the cause of the jam (clearing an obstacle from the mechanism, freeing the paper or ribbon, etc.).

F.2 CARD READER CLEANING

ALL systems using optical or magnetic card readers require these readers be cleaned on a regular basis.

The reader should be cleaned at a *minimum once a month*, though once a week cleaning is strongly suggested. Clean the head more often for busy sites, or whenever performance begins to suffer (numerous bad reads, etc.).

You will need a Cleaning card (several supplied with the system), and isopropyl alcohol

1. System power should be ON.

2. Apply a little isopropyl alcohol to a cleaning card, and immediately insert the card into the reader.

3. Withdraw the card, and throw it away. Cards are single-use ONLY.

Notes:

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Notes:

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