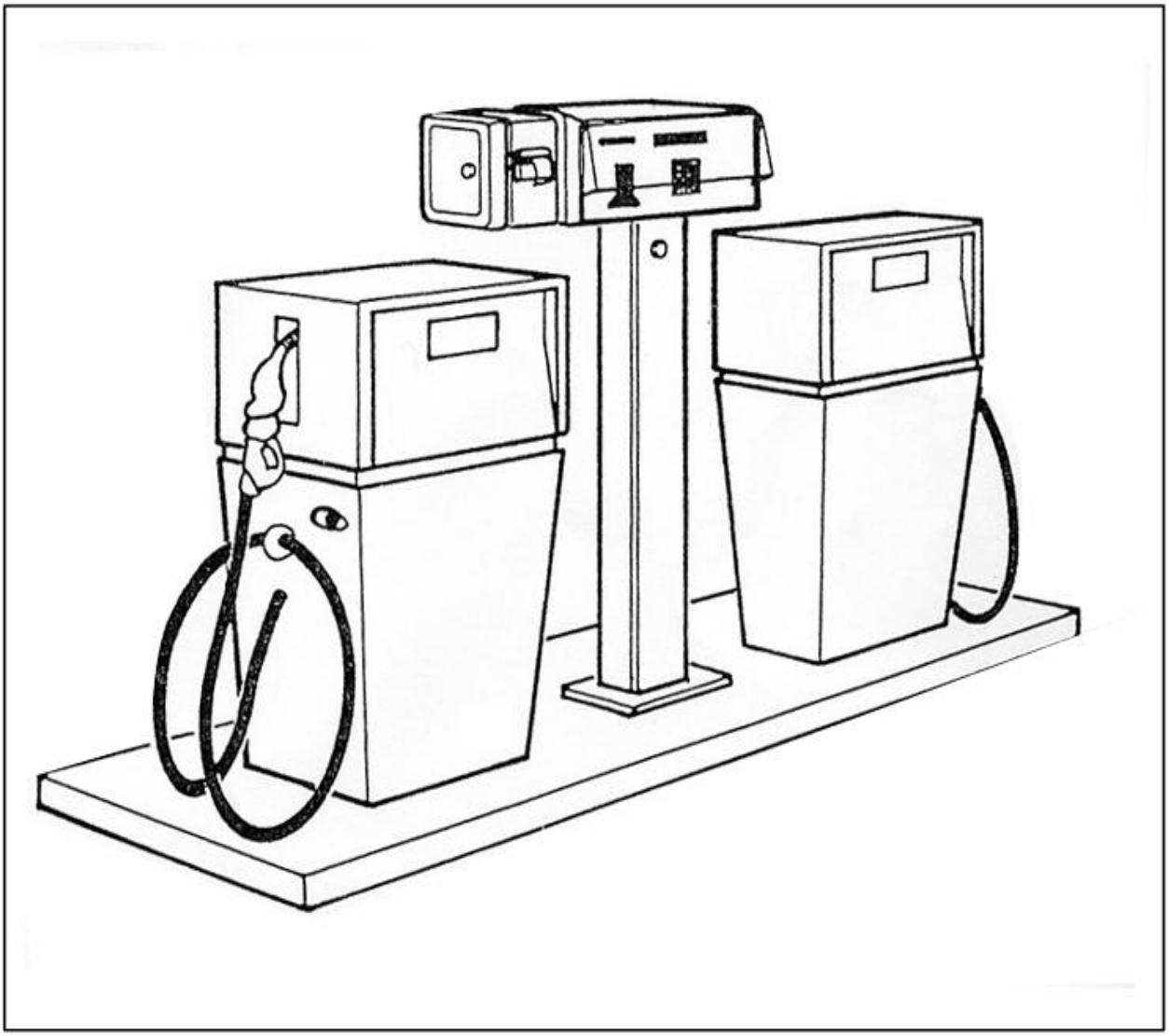
COMPUTROL

Automated Fuel Control Systems

System Manager's User Guide



COMPUTROL FUEL CONTROL SYSTEMS

SYSTEM MANAGER USER'S MANUAL

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SOFTWARE

This manual supports all Computrol Pump Control Unit (PCU) systems including the Fleet 300, Fleet 600, Model 600 and Model 600E installed with Software Release Version 3.0 (S.R. 3.0) or greater versions. Refer to other manuals for use of application software programs.

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An additional note to Computrol users:

This Manual may optionally include Appendix D: Software Release Bulletin. This section is designed to provide user information specific to the software running in your Computrol unit. The Software Release Bulletin (SRB) acts as an addendum to the main User's Manual and also serves as a mechanism to document custom features in the software we provide.

If you wish further information on the SRB or find it does not match the software your PCU uses, please notify your dealer or the manufacturer:

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1.0 COMPUTROL SYSTEM OVERVIEW

1.1 GENERAL

The Computrol Fuel Control System is an advanced microcomputer based electronic fuel management system. It is efficient and cost effective, offering a number of invaluable benefits including total fuel security, maintenance-free operation, extremely versatile record keeping, and efficient data processing for accounting purposes, fleet management, and cost control.

The System consists of one or more Computrol Pump Control Units (PCUs) wired directly to, or connected via the telephone system to a conveniently located desktop computer or a mainframe.

Each PCU is completely self-contained on the fuel island and includes card reader, microcomputer, memory, and pump control circuits.

PCUs are available in several models with various memory, card, and pump capacities.

In order to obtain fuel, a driver or customer must momentarily place a valid Computrol card squarely against the card reader recess on the PCU faceplate. A System Manager may program his PCUs so that a second card or auxiliary numbers must be entered before a pump can be activated.

Additionally, the software in the PCU permits the selective restriction of product and quantity available to each card. All hoses can be activated simultaneously.

As each fuel-up terminates, it is recorded in the PCU's battery-protected memory and may also be printed in hard copy on an on-line audit printer. If the PCU is fitted with an optional Computrol Receipt Printer, a Weights & Measures approved ticket will also be generated for the customer.

Transaction data accumulates chronologically in the PCU memory and can be retrieved at any time. Operating software in the PCU permits transactions to be polled and printed chronologically, by customer card, by vehicle card, by pump, or by sequential transaction number.

While a basic system will generally be controlled with a standard terminal printer, Computrol PCUs will readily communicate with most desk top microcomputers as well as certain mainframe computers. Additionally, Computrol Fuel Systems Inc. can provide microcomputer programs capable of generating a range of fuel usage reports, preventative maintenance reports, and commercial invoices.

1.2 SYSTEM FEATURES

Certification

- Pump Control Units are designed and manufactured in Canada; they are CSA certified and UL listed.

Design

- PCUs are designed with proven microprocessor technology
- PCUs contain an integrated card reader, microcomputer and pump control circuits in an environmentally sealed housing
- Installation costs are lower than with other card systems
- All components are modular for easy service and expansion

1.2 SYSTEM FEATURES (cont'd)

Capacities

- C600E accepts up to 50,000 cards (any combination of Operator and/or Vehicle)
- C600 accepts up to 10,000 cards (any combination of Operator and/or Vehicle)
- C600 and C600E simultaneously control up to 4 hoses up to 8 optional with external relays)
- C600 retains 1200 transactions (2400 optional)
- C600E retains 1200 transactions (3000 optional)
- C600 may be readily upgraded to C600E capacity

Cards

- Computrol's unique inductively read coil cards are impervious to oil, moisture and grime
- the cards are the most durable available: designed for prolonged heavy duty use
- cards are factory coded: no coding machine is required
- cards include fitted key ring eyelet
- cards can be enabled or disabled instantly individually or in blocks even from a remotely located control terminal
- four (4) digit discreet security numbers available for any or all cards

Selectable Restrictions

- System Manager may select one and/or two card operation
- System Manager can program PCUs to request odometer entry (7 digits)
- System Manager can program PCUs to confirm the accuracy of the odometers entered
- System Manager can program PCUs to request unit entry (7 digits)
- Cards may be restricted to specific pump numbers (products) at multiple fuel sites
- System Manager can assign one of 16 different fuel limits to each card
- System Manager can program a different delivery limit for each pump
- Illuminated LCD Display provides easy to follow instructions to the card holders
- System Manager can select no-flow pump shutdown time from 0-120 sec.
- System Manager can select a no-pulse pump shutdown time from 0-10 sec.

Transaction Reporting

- Every transaction is sequentially numbered and recorded Method of transaction termination is reported (normal, pump limit, timeout)
- Date and time (24 hr. clock) automatically recorded
- Pump number and product identity always reported
- All card use is recorded - whether valid, or invalid
- Litres, gallons or kilograms are automatically recorded in tenths or hundredths
- All PCUs contain two accumulating electronic totalizers for each hose (one resets when memory is cleared, the second can be reset at any time by the System Manager)
- PCUs are capable of reporting transactions sorted and totaled by operator or vehicle to provide managers with period reports

1.2 SYSTEM FEATURES (cont'd)

Security

- Discreet passwords set by the System Manager are required to 'Sign On' to the System or 'Clear' the transactions
- Transaction memory cannot be cleared unless all transactions have been listed
- Manual bypass can only be activated by the System Manager using a special override switch
- Bypass transactions can also be recorded
- The PCU is enclosed in a rugged cast housing: it is completely weatherproof and the most vandal resistant enclosure available
- 'Missing Pulse Detect' circuit protects against pulser failure (requires a flow switch in fuel line)
- Automatic 'Time-Out' turns pumps off if left on by driver or customer
- 'Watchdog' timer circuit protects the microprocessor against power failure
- Four (4) digit P.I.N. security numbers may be selectively activated for any or all cards

Communication

- Each PCU features up to four Serial RS-232C communication channels:
  (Channel 4 is undefined)

  Channel 1 is an input/output channel for two way communication with a control terminal

  Channel 2 the second channel is a control terminal with a one way 'write only' channel which supports a hard copy audit printer

  Channel 3 the third is used in special applications to communicate with card readers such as magnetic stripe, Securakey or weigand technology.

- Communication format is ASCII
  8 bit word (7 optional) 1 Stop Bit is used
  No parity is used (Even parity optional)
  Speed is jumper selectable between:
  300/1200 or 1200/2400
- All PCUs are modem ready
- Optional packed data protocols allow rapid retrieval of transaction data and virtually instantaneous reloading of card authorization lists
- PCUs will communicate with most popular business microcomputers either over a direct line or via the dialup telephone system

1.3 SYSTEM COMPONENTS

A Computrol Fuel Control System consists of three primary components:

1. Pump Control Unit(s) (PCU)
2. Cards
3. Control Terminal
   (PC Compatible running simple terminal software)

1.3 SYSTEM COMPONENTS (cont'd)

Additionally, certain secondary components may be installed.

4. Fuel Management Software
   (for PC Compatible computer)
5. Audit Trail Printer
6. Telephone Modems
7. Customer Receipt Printer

1.3.1 THE PUMP CONTROL UNIT (PCU)

The PCU is completely self-contained and includes card reader, microcomputer, memory, and pump control circuits. It is heavily protected against all hazards and is designed for unattended use in the most rugged environments.

It is mounted on a welded steel pedestal which stands the PCU at a height of approximately five feet. The height of the island, which may be anywhere from 8 - 16 inches, raises the PCU to eye level.

FUNCTION

The PCU simultaneously handles six primary tasks:

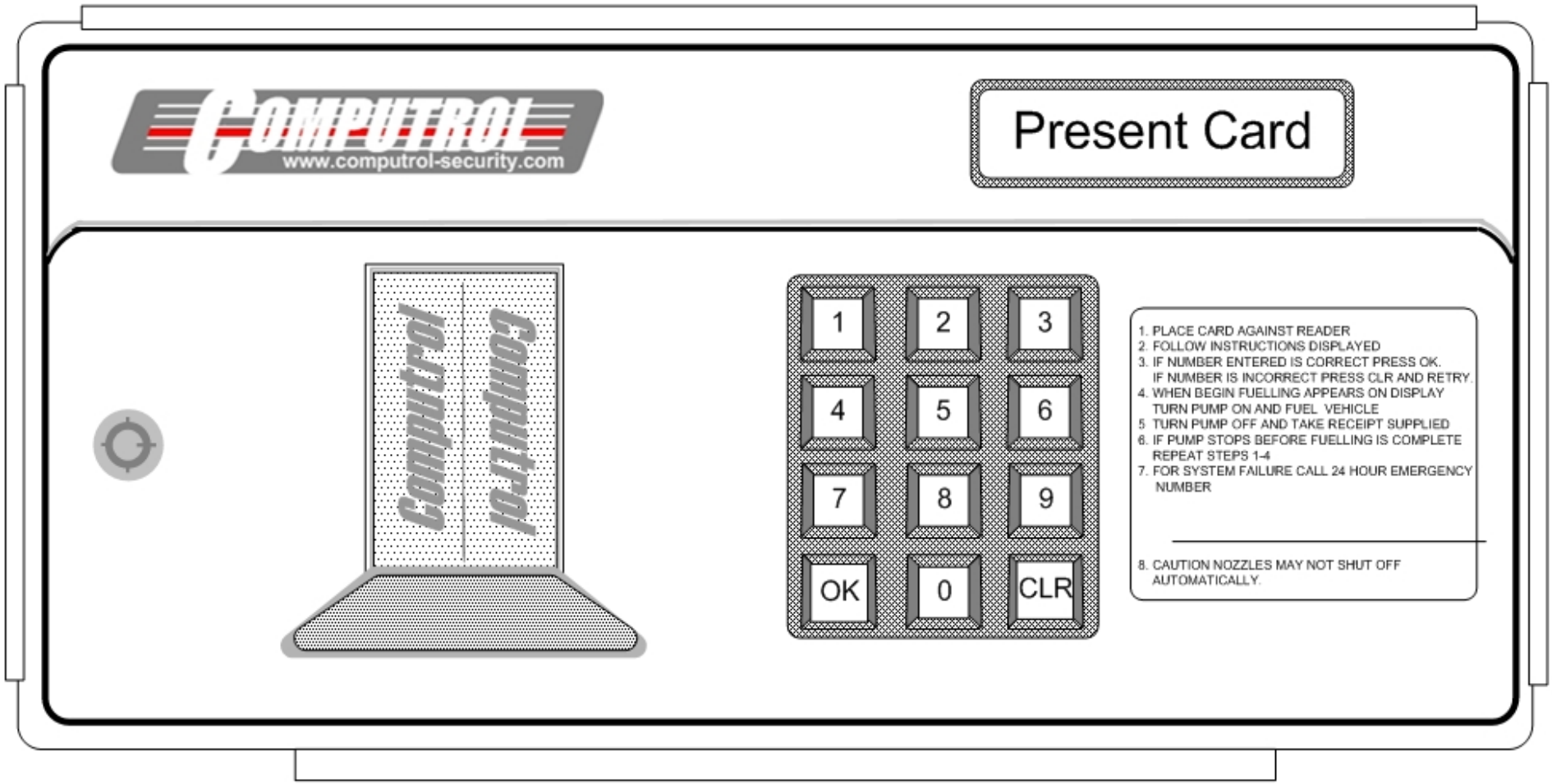
- It reads and accepts valid Computrol cards, permitting the cardholder to start the refuelling procedure.
- It measures product flow by counting volume indicating signals from electronic pulsers mounted on the pump registers.
- It accurately records the vital data of every fuel transaction.
- It stores a large number of fuel transactions in a battery protected memory.
- It transmits the transaction data to the optional Customer Receipt Printer and can also send the same data to an optional hard copy Audit Printer installed on-site or at a remote location.
- It sorts and prints authorizations and accumulated data, on command, on the Control Terminal. Fuel data may be reported by Operator Card, Vehicle Card, Pump Number or Transaction Number. Additionally, accumulated pump volume totals and a concise list of authorized and de-authorized cards can be printed instantly.

EXTERNAL COMPONENTS

Card Reader

The Card Reader is a recessed area on the front face of the PCU. It is an energized surface fitted with a label matching those on your operator and/or vehicle cards. Cards are read by placing them momentarily (1/2 second) against the reader surface.

Computrol Pump Control Unit
Front View



t300-
faceplate2.vsd

1.3.1 THE PUMP CONTROL UNIT (PCU) (Cont'd)

Display

The Liquid Crystal Display is fitted behind a weatherproof window recessed into the upper right corner of the front face of the PCU. The display presents a series of easy to follow alphanumeric messages which guide the cardholder through the refuelling procedure. Additionally, the display will show certain diagnostic or system management instructions.

Keypad

The keypad, fitted to the front face of the PCU, is an all weather push-button pad containing digits '0 to 9', an 'OK' and a 'CLR' button. The keypad is used by the cardholder to enter P.I.N. security numbers (where required), to select pump number required, and to enter auxiliary information such as odometer reading, unit identification number, etc.

INTERNAL COMPONENTS

Hardware

The internal hardware of the C600 and C600E consists of three major modules as follows:

- Power Supply Transforms 115 VAC service to +5 and +/-12 VDC to power various electronic components.
- Card Cage Utilizing STD BUS architecture, the card cage contains several circuit boards which plug into a main 'motherboard'. This module includes microprocessor and memory boards.
- Pump Control Circuits Consists of mercury switched relays which switch AC service to pumps. These modules and circuit boards are designed to be quickly exchanged in the event of service.

Software

Read Only Memory (ROM) software, coded at the factory, allows the System Owner to select the type of operating restrictions that best meet his specific requirements. These restrictions are selected after the System is installed (see Configuration Sequence, Section 2.3), and may be altered at any time.

Random Access Memory (RAM) contains two tables which can be changed at any time by the System Manager; the Authorization Table and the Pump Table. The Authorization Table is an electronic register of all card numbers in the Master Card Series assigned to each system. Each Master Series can contain up to 50,000 card numbers, however the range of active card numbers in each System will be determined during System Configuration. Each number stored in this table will be flagged as "on" or "off", which means "Enabled" or "Disabled". Each time a user card is presented, the PCU checks the card number against the Authorization Table to verify that the card number is "on" or enabled before continuing with the fuelling procedure.

The Pump Table is similar to the Authorization Table in that it identifies which pump numbers are "on" or "off". Additionally, it records the pump numbers to which each user card is restricted.

1.3.1 THE PUMP CONTROL UNIT (PCU) (Cont'd)

The RAM memory contains a third table which cannot be altered once it is recorded. The Transaction Table is an electronic record of each and every fuel up, and includes transaction number, date and time, pump number and name, operator and vehicle card numbers, auxiliary number entry, and volume dispensed. The Transaction Table will also record power outages, and presentation of invalid or illegal cards. The Transaction Table may be accessed at any time by the System Manager.

1.3.2 CARDS

The patented Computrol card has a secure, unique number that is hard-encoded into 24 miniature coils. The encoded number is read by induction when the card is placed against the card reader surface. The coil connections on the card are sensed by the reader and translated to a number that is checked for authorization. There are 10,000 number codes or 50,000 number codes in each series of Computrol cards. The coils are formed of metal conductors and are backed on a fiberglass card. This construction makes the card both durable and virtually impossible to reproduce by counterfeit means. The card is the same size as a regular credit card with an extra 2 cm tab which allows easy attachment to a keyring without interfering with reading of the card. The cards are covered with a mylar label. Standard or custom-produced labels are available.

The reading of cards by induction has two significant advantages:

- the card is placed against the reader, it does not need to be inserted into or pulled through the reader
- the reader will read cards accurately through the label and even through an accumulation of grease and grime

The encoding algorithm devised for the Computrol card and the card's unique design eliminate the possibility of reading the card erroneously.

The type of card: Operator, Vehicle, or Both, is determined when the card is enabled (authorized) in the Pump Control Unit. It can easily be changed at any time. For instance, an unused vehicle card can be reused as an operator card without altering the actual card.

1.3.3 THE CONTROL TERMINAL

The Pump Control Unit is a stand-alone device which performs all of the fuel island tasks required. These tasks include storing transactions and card authorizations. The Control Terminal provides the System Manager with a way to program and retrieve data from the PCU.

PC Compatible computers are the most common control terminals though mainframes are often used to perform the same functions. It is also possible to use a keyboard printer terminal or any other RS232 device.

Using a PC Compatible provides the System Manager the ability to look at the reports on screen, or store them on disk at the same time. Once the data is on disk it can be printed or examined later. Computrol offers a wide range of Application Programs to process the transaction data from the Computrol PCU and produce very sophisticated and comprehensive reports.

Computrol's stand-alone capability enables a single "Control Terminal" to connect, as required to, one or many sites using telephone modems to communicate over long distances. This allows a multisite operation to produce centralized reports and centralize the control.

1.3.4 AUDIT TRAIL PRINTER

When a fuel transaction occurs, the PCU stores the information in memory for listing at a later time. A copy of the transaction record is also transmitted over the communications cable for immediate or real-time printing. If a printing terminal is being used to control the system, the audit trail will be sent to it automatically. Any control functions, card authorizations or requested listings will be intermingled with the audit trail.

If a computer is being used to control the system, the audit trail could be lost unless the computer monitors the PCU at all times. To free the computer from this task, a separate audit trail printer is used.

There are two methods of connecting the audit trail printer to the PCU. Figure 1.3.4 (a) shows the Computrol using a SEPARATE audit trail which is connected to the printer at all times. The controlling computer is used for listings, authorizations, etc., but is free to perform other duties in between. Since this method requires two communications lines, it is usually used where the equipment is hard-wired together.

Figure 1.3.4 (b) shows the COMBINED audit trail version. The data switch normally directs the real-time listing to the printer. When the computer is required, the data switch is moved to the other position, causing the PCU to be connected to the computer instead of the printer. After polling, the switch is restored to the audit trail position. This method is generally used when the PCU is at a remote site, since only one set of leased lines and line drivers is required.

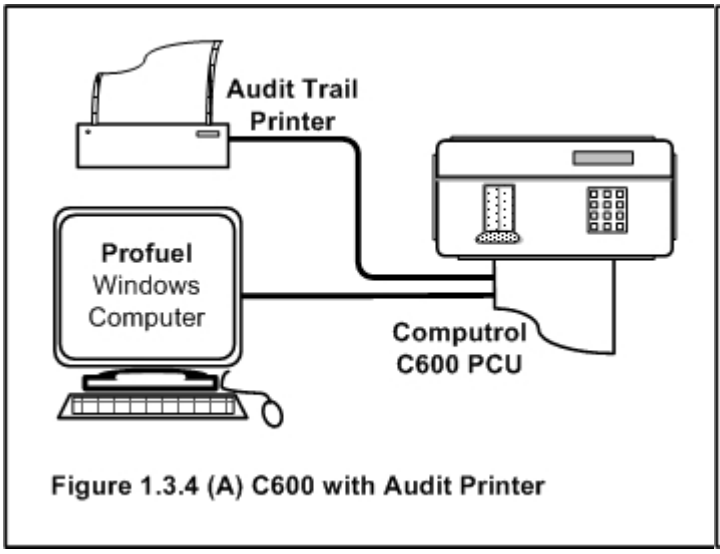


Figure 1.3.4 (A) C600 with Audit Printer

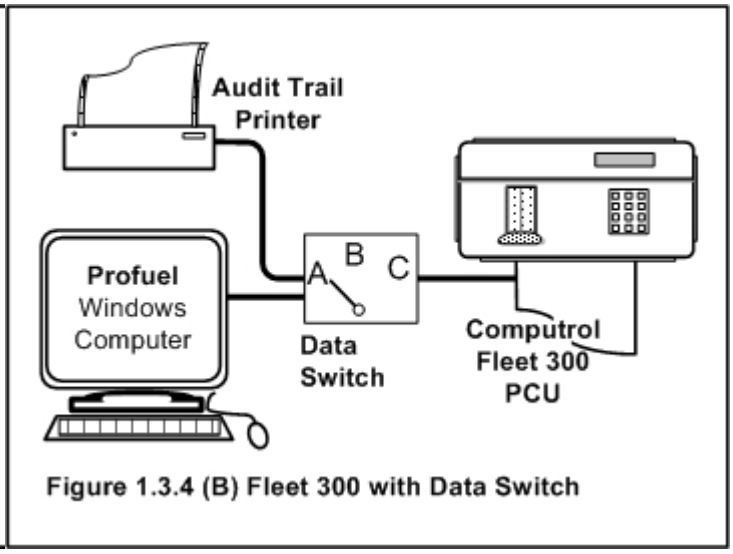


Figure 1.3.4 (B) Fleet 300 with Data Switch

1.3.5 TELEPHONE MODEMS

A modem is a device that changes a computer's data signals into audio frequency signals which can be transmitted over ordinary telephone lines. One unit is required at each end of the line to send the signals and receive and decode the incoming signals. The name is actually an acronym for MOdulate/DEModulate. Without modems, computer communications would be restricted to about 100 feet.

Different types of modem equipment are available. One is a full-fledged modem, designed to be used with standard phone lines. It requires the presence of a dial tone, ring signal, etc. This type of modem is used to dial up a remote computer, transfer any necessary data, then hang up afterwards. The dialing can be done manually by the computer operator, or automatically by the computer using an Autodial mode.

The other type of modem is called a line driver or limited distance data set. These modems are designed to be connected to each other at all times, either over private lines or dedicated lines leased from the phone company. They do not require dial tones or ring signals.

Figure 1.3.5 (a) and (b) show different uses of modems to connect Computrol PCUs to remote PC computers.

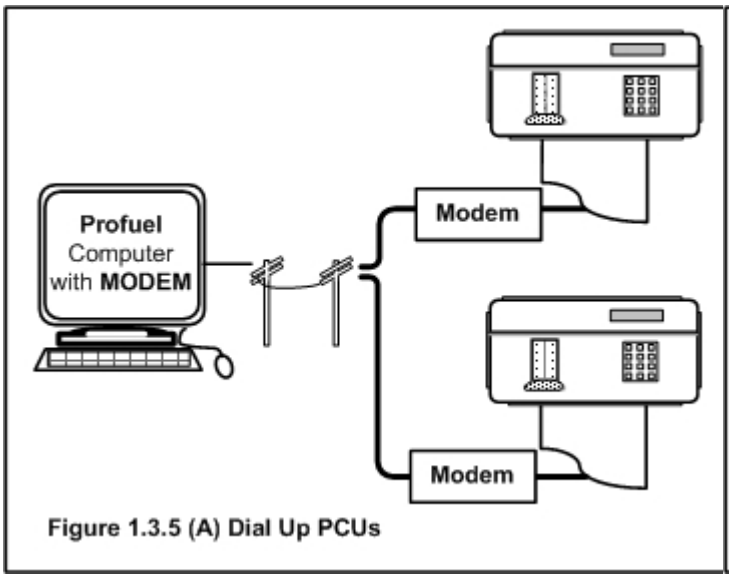
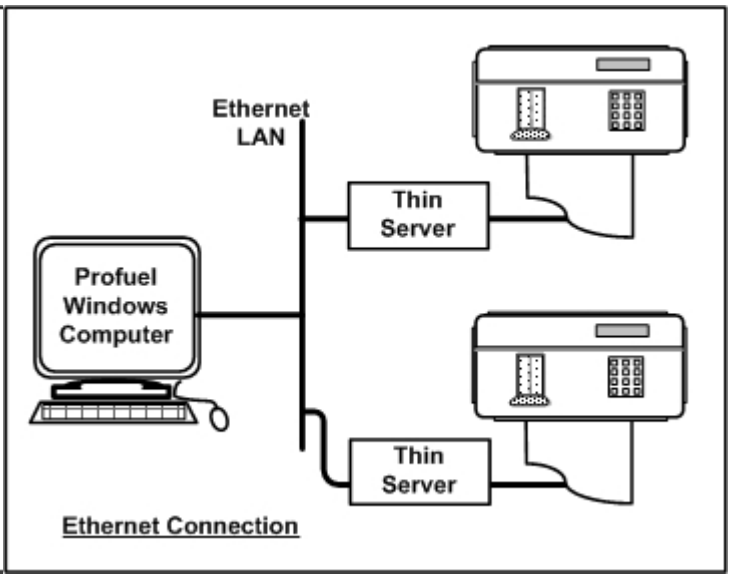


Figure 1.3.5 (A) Dial Up PCUs



Ethernet Connection

1.3.6 CUSTOMER RECEIPT PRINTER

The optional receipt printer is a separate unit bolted to the PCU. Figure (a) shows the receipt printer and a sample receipt. A separate door, key and lock are used in order to replace the paper roll and printer ribbon. Refer to Section 6 - MAINTENANCE for instructions.

1.4 SYSTEM MANAGEMENT

The Computrol PCU provides a number of customer-selected features which assist in the management of pumps and cards. Upon installation of the PCU at the customer's premises, these options must be chosen, as they are implemented during the System Configuration phase. These features are described below.

1.4.1 PUMP MANAGEMENT

The Fuel Control System can accommodate a maximum of 8 pumps per PCU. Pump numbers are hard-wired at installation and cannot be changed by the customer. The E(NABLE)/D(ISABLE) commands designate whether fuel can be dispensed from a pump.

In addition, the System Manager may change the Pump Name, Fuel Limit, and Accumulated Total on each pump with the S(ET) P(UMP) command (see Section 3). Both of these commands are pump- specific and allow the System Manager full control of the pumps.

1.4.2 CARD MANAGEMENT

Computrol Cards are used by drivers to activate pumps enabled for use. Each Fuel Control System comes with a unique range of cards, and each card is assigned a number of options which restrict it use. All cards are "Enabled" or "Disabled" to indicate whether the card has been activated to allow fuel dispensing or not. Thus, cards which have been lost or stolen are prevented from using the system.

A number of optional features must be selected before the System Manager begins the System Configuration phase. Further changes may be made, (for example, the fuel limit on a card may be increased or the card may be removed from the system) using Section 3 - SYSTEM MANAGEMENT COMMANDS. A complete description of the various card options follows.

1.4.2.1 ONE CARD SYSTEM

In a one card system, a single card is assigned to each driver/employee; each customer; or each vehicle. On the card authorization reports, an activated card is represented with an "E" for ENABLED, while a dot "." indicates a DISABLED card. If the cards are ENABLED with a P.I.N., then they are further represented with a "P"; see Section 4 - REPORT GENERATION COMMANDS for more information.

1.4.2.2 TWO CARD SYSTEM

In a two card system, one card is assigned to the driver and another card is assigned to the vehicle. Drivers are requested to present both cards to begin the fuelling process. Cards may be one of three types: Operator, Vehicle, or Both. These types are programmed for the card by the System Manager using the E(NABLE) C(ARD) commands, see Section 3. They appear as "O", "V", or B" respectively on the relevant card authorization reports. See Section 4 for explanation of these reports.

NOTE: A "B" card takes the place of using two separate Operator and Vehicle cards. Thus, a driver assigned a "BOTH" card need present only one card at the PCU.

1.4.2.3 PERSONAL IDENTIFICATION NUMBER (P.I.N.)

Personal Identification Number is an optional feature designed to increase the security of the Fuel Control System. This is a four digit number designated by Computrol, produced in the software and assigned by the System Manager to all or specific drivers. In order to start the fuelling process, drivers must present their card(s) and enter their P.I.N.s using the keypad. As a further security feature, the entered P.I.N. is not echoed on the PCU display; asterisks (*) appear instead. The driver has three chances to enter the correct P.I.N. before the display reverts to "PRESENT CARD". A diagnostic transaction is also logged in the PCU indicating an unsuccessful attempt to enter a P.I.N.

1.4.2.4 FUEL LIMITS

As an optional feature, cards can be limited as to the amount of fuel that can be dispensed from any pump in one transaction. The System Manager assigns the fuel limit for individual cards by using the E(NABLE) C(ARD) commands explained in Section 3. There are 16 different fuel limits which may be individually set with the S(ET) L(IMITS) command, also explained in Section 3.

NOTES: 1. Pumps are also set with a fuel limit. The S(ET) P(UMP) feature limits the amount of fuel dispensed at one filling. See Section 3 for explanation of this command.
2. If both cards and pumps have fuel limits, the PCU terminates the fuelling at whichever limit is the lower. If the PCU terminates the fuelling because the card's fuel limit has been reached, it logs "TRN LMT" for "Transaction Limit" under the "TERM" heading in the transaction reports.

If the reason for termination was that the pump limit was reached, the PCU logs "PMP LMT" for "Pump Limit" under that heading.

1.4.2.5 ODOMETER ENTRY

This is an optional feature which requires all individual cardholders to enter their odometer reading, unit number or other required number. This information then becomes part of the transaction data and reports. It does not affect system operation except with regard to report interpretation.

1.4.2.6 ODOMETER VERIFICATION

This optional feature provides the System Manager with the ability to ensure the accuracy of the odometer readings entered by the cardholders. Special software must be specified at the time of ordering. See Section 2 for a detailed explanation and Section 3 for the commands associated with this option.

When implementing this feature, cards are assigned to each vehicle. Before fuelling a vehicle, the driver will be required to enter a meter reading. The new meter reading is compared to the last one entered which stored in the PCU's memory. If the new number is within a window of acceptability the transaction proceeds normally. This window is called the variance and is represented by a variance code.

If the number is too high or low, the driver will be prompted to re-enter the number. After three attempts the transaction may proceed but will be flagged as having an invalid odometer.

1.4.2.6 ODOMETER VERIFICATION (cont'd)

Originally this software feature required the System Manager to decide at time of ordering whether the drivers would get fuel or be locked out when odometers were not accurate. Subsequent releases offered the choice stop or go on invalid odometers as a site configurable option.

As of September 1991 all new versions of this software will offer both stop and go in the same PCU. This is accomplished by specifying some variance codes to allow fuelling and others to deny access to the fuel after invalid odometer readings are entered.

1.4.2.7 2ND FIELD ENTRY

This optional feature can be implemented in the system configuration to allow the PCU to capture an extra field of numeric data such as hourmeter, employee number or work order number. This field is capture only and is not checked for accuracy. The filed can be given any name up to 8 characters which are displayed when the driver is prompted displayed

1.4.2.8 KEYPAD ENTRY OF CARD NUMBERS

This feature is designed to allow a System Manager to design the system operation using two "card" operation while assigning only one card. The 'other' card is a number entered from the keypad. Special software is required to implement this feature.

Under this operation the driver may be required to follow one of these combinations:

- vehicle card with driver ID from keypad
- driver card with vehicle number from keypad
- driver ID and vehicle number from keypad

1.4.2.9 PUMP AUTHORIZATION

This optional feature, often referred to as "Product Restriction", allows the System Manager to individually restrict each card to a specific pump (fuel type) or range of pumps (fuel types). Cards are restricted to specific pump(s) during the ENABLE CARD procedure (Section 3.6). Should this option not be implemented, all cards will activate all pumps.

In a two card system, product restriction will be programmed against the second card, i.e. the Vehicle card.

2.1 SYSTEM SET UP -- SELECTION

Prior to putting your Computrol System into control operation, a number of important System Parameters must be selected. These parameters include the pump and card capacities of your Fuel Control System, restrictions to be placed upon the fuel pumps, restrictions placed upon the type and authorization level of the user cards, and security features required.

The System Parameters may be selected at three different times:
- Upon ordering the PCU from the manufacturer
- At installation time
- By the customer as required, once the unit has been installed

The following System Parameters must be selected when the Computrol PCU is ordered from the manufacturer:

2.1.1. MEMORY ALLOCATION (RAM)

The Random Access Memory (RAM) in the PCUs is used to store operation parameters such as pump information and tables for card authorization and transaction data. The allocations are:

Pump Stat's - based on the number of pumps
Card Table - based on the range of cards and the parameters of authorization selected.

Features such as product restriction, P.I.N., Limits By Card and Odometer Verification require extra memory space for each card authorized.

Transactions - Once the allocations above have been completed a calculation is performed on the remaining memory to determine how many transactions can be stored. The number of transactions which can be stored is also dependent on the size of the transaction. When a PCU is configured to capture two card numbers and odometer readings each transaction requires more space than single card systems with no data capture and fewer transactions are stored.

2.1.2 PUMP CAPACITIES

The Computrol Fuel Control system comes with a standard capacity for controlling up to 4 pumps. Optionally the following expansions are available:

PCU Model	Pump Capacity
C600	4 standard, up to 8 maximum
C600E	4 standard, up to 8 maximum
F600	2 standard, up to 4 maximum
F300	2 standard, up to 4 maximum

2.1.3 CARD CAPACITIES

Each PCU has a maximum number of total cards which can be used within the configuration. Once this maximum has been exceeded in a C600 system, an upgrade to C600E is possible.

PCU Model	Card Capacities
C600	10,000
C600E	50,000
F600	1,000 standard 3,000 maximum
F300	300 standard 3,000 maximum

2.1.4 TRANSACTION STORAGE CAPACITIES

Each PCU can store a certain number of fuel transactions before the RAM memory must be cleared. Transaction storage capacity will vary depending on the number of options configured for your system.

Model	RAM Size	Transaction Storage Capacity
C600	32K	1700 minimum (2700 maximum)
C600E	96K	2600 minimum (3600 maximum)
F600		200 minimum (580 maximum)
F300		200 minimum (580 maximum)

2.1.5. ODOMETER VERIFICATION

This feature is designed to check the accuracy of odometer and hourmeter readings captured by the C600 PCU. Since 1980 Computrol has provided customers with the ability to capture the readings by prompting the driver to key the data in using the PCU's keypad. In the late 1980s Computrol enhanced the data capture capabilities of the PCU by storing the last number entered for each vehicle so the new one could be compared and discarded if not acceptable.

Fleets with more than one yard/PCU are able to implement Computrol's Autopoll Plus program to automatically collect the transactions with the odometer data and update the meter readings in the PCUs in their network to the most current readings. This ensures that a vehicle's odometer is checked against the latest reading on file regardless of where the vehicle was fuelled last.

This is a very powerful tool in providing accurate fleet performance records and cost analysis reports for the Fleet Manager.

The PCU stores, for each vehicle, an old odometer and a variance. When a new number is entered it must be larger than the old number but not by more than the variance assigned.

Example:
Vehicle 42331 has an odometer reading of 12000Km on a given day and takes fuel at the Computrol PCU in the South Yard. The variance code is 2 which indicates a variance of 200.
That day at midnight Autopoll is run and the transactions are collected. The program extracts the largest odometer reading for each vehicle and prepares a table which is downloaded to each PCU minutes later.

2.1.5. ODOMETER VERIFICATION (cont'd)

On the second day Vehicle 42331 attempts to get fuel at the North Yard and a meter reading of 13000K is entered.

13000K is larger than 12000K by a margin of 1000.

The Variance allowed is 200 therefore the new odometer reading is not acceptable.

The driver is prompted to re-enter the meter reading and after a third attempt the transaction proceeds with a flag that the meter reading is not valid.

The flag on the transaction is a "-" sign placed in front of the meter reading captured in the transaction. This "-" sign will prevent the data from being used in future downloads and in preventative maintenance programs. In some cases the system manager may decide to disallow fuelling when invalid meter readings are entered. The commands used in the PCU with the implementation of the odometer verification feature are as follows.

E(NABLE) V(EHICLE)
Card #'(s): 42331
Code #(0): 2
Odom #(0): 12000
>

S(ET) VA(RIANCE)
Code # (s) : 1-2
Code = 1 Variance = 100
Code = 2 Variance = 200

>

P(RINT) VA(RIANCE)
Code = 1 Variance = 100
Code = 2 Variance = 200
Code = 3 Variance = 300
Code = 4 Variance = 400
Code = 5 Variance = 500
Code = 6 Variance = 600
Code = 7 Variance = 700
Code = 8 Variance = 800
Code = 9 Variance = 900

A Variance Code number 0 exists in the system as well. It is assigned to vehicles or units for which no meter readings should be checked. The Variance Code 0 is also used to initialize the network by capturing the meter readings from each vehicle. Once the meter readings are in the PCUs the System Manager can change the Variance Code for each vehicle to an appropriate value.

2.2 SYSTEM SET UP -- CONFIGURATION

Prior to putting your Computrol System into active operation, you must individually set up, or program, each of your PCUs for the restrictions and operating sequence you require.

The operating software in the C600, C600E and Fleet PCUs is highly flexible and allows you to set the parameters of your own system at installation time with a series of questions, each of which is outlined in this section. This start up routine is referred to as SYSTEM CONFIGURATION.

There are three situations in which SYSTEM CONFIGURATION will be used:

- System start up
- If a ROM memory board in the PCU is exchanged
- To alter certain functions or limitations in your system, you can reconfigure by using "master reset" command (see Section 3).

The first System Configuration will generally be completed by an authorized Computrol technician. Prior to reconfiguring it is wise to check with the factory or a trained agent.

2.3 CONFIGURATION SEQUENCE

When your PCU has been correctly installed and powered up, it will initiate the "System Configuration" routine. This routine can also be initiated by use of the "master reset" command. The message "PLEASE WAIT" will appear on the PCU display and the control terminal will print:

"Computrol 600 - SRX.XX Configuration"

The following questions/prompts will then appear on your control terminal. Each response must be followed by <RETURN>. (or the <ENTER> key.) It is a very good suggestion to keep a hard copy of the system configuration each time it is done. The copy can be stapled into the back of this manual for safe keeping.

NOTE: The questions /prompts used in the system configuration will differ slightly with each software version. Do not be concerned if the following example does not correspond exactly to the to prompts you see.

SAMPLE CONFIGURATION

SYSTEM PROMPT	MANAGER RESPONSE
1. Card Series #(200-218):	Enter your three digit card series number as provided by Computrol. If you are using an alternative card technology the number may be only 2 digits.
2. Minimum Card#=	Enter the lowest card number to be enabled and employed in your system.
3. Maximum Card#=	Enter the highest card number to be accepted in your system.
4. Card Number Offset=	Enter "0" unless advised otherwise by Computrol. This is a rarely used feature which allows a numerical difference between actual card codes and card numbers reported on the control terminal.
5. Number of Pumps=	Enter a single digit corresponding with the number of pumps controlled by the PCU being configured.
6. Volume Units in L(ITRES) or G(ALLONS) or K(ILOGRAMS):=	Enter "L" "G" or :K: according to the units of measurement on your pump registers.

NOTE: Prompts 7 through 13 will now be repeated for each pump controlled by this PCU as defined in your response to prompt #5 above.

7. Pump Name (. . . . .):	Enter up to 15 alphanumeric characters identifying Pump 1 product.
8. Pulser Ratio 100:1 Y(ES) or N(O):	Enter "Y" if Pump #1 register is fitted with 100:1 pulser. If response is "N", the system will generate the next prompt.
9. Pulser Ratio 10:1 Y(ES) or N(O):	Enter "Y" if Pump #1 register is fitted with 10:1 pulser. If response is "N", the system will generate the next prompt.
10. Pulser Ration 1:1 Y(ES) or N(O):	Enter response as in #8 or #9. An "N" response will now result in a repeat of prompt #8.
11. Flow Switch present Y(ES) or N(O):	Enter "Y" if your pump has an optional flow monitoring switch installed. This switch, supplied by your pump service company, indicates to the PCU that product is flowing. It is used to protect against pulser failure. Should the PCU detect flow but no pulses, it will turn off the pump motor circuit
12. Pump Fuel Limit (0):	Enter a number up to 9999 maximum restricting volume allowed per transaction for this pump.
13. Pump Total (0):	PCU software includes an accumulative electronic totalizer for each hose circuit. Enter any number up to six digits (999999 maximum). This accumulating number may be accessed or changed at any time for inventory control purposes.

SYSTEM PROMPT	MANAGER RESPONSE
14. No-Flow Timeout (0 to 120 seconds):	The PCU measures fuel volume dispensed by counting pulses received from an electronic pulse generator mounted on each pump register. All fuel flow must be accompanied by pulse signals. When fuel flow stops, for any reason, pulse signals received by the PCU will also cease. The pump motor power will be disconnected , automatically, after the interval specified.

NOTE: The following Card Options require a Y(ES) or N(O) answer.

15. Missing pulse timeout (0 to 10 seconds):	This response will be used when optional flow switch(es) are in the pumps. The switches indicate fuel is flowing and if flow is not accompanied by pulses (see Prompt #14) then the PCU will automatically shut the pump off after this interval.
16. Single Card System:	Enter "Y" for a single card system. Enter "N" for a dual card system.
17. Odometer Entry:	Enter "Y" if cardholders are required to enter odometer reading prior to fuelling. Prompt #19 will now appear. Enter "N" if odometer entry is not required. Prompt #18 will now occur.
18. Unit # Entry:	Enter "Y" if cardholders are required to enter unit # identity prior to fuelling. Enter "N" if unit # entry is not required.
19. Pump Authorization:	Enter "Y" if user cards are to be restricted to specific pump numbers/products, "N" if cards are to be used at all pumps.
20. P.I.N. Control:	Enter "Y" is you wish to activate 4 digit security numbers for some (all) cards. Enter "N" if no security numbers will be used on your system.
21. Fuel Limits per Card:	Enter "Y" if you wish to assign a transaction volume limit to any or all of your user cards. Enter "N" if volume limits per card transaction are not required.

NOTE: At this point in the configuration, the PCU will calculate the amount of memory required for the selected options. If the storage requirement is too large for the available memory, the system prints "Insufficient memory space for configuration" and reverts to the beginning of the configuration, "Card Series #..." etc...

SYSTEM PROMPT	**MANAGER RESPONSE**
22. Max. No. of Transactions 1500 Req'd Number of Transactions=	Enter the number of transactions you wish this PCU to store. If your entry is within the calculated maximum (example of 1500 above), the configuration will advance to Prompt #23. If your transaction storage requirement figure is too large for existing memory, the prompt will be repeated, and reverts to the beginning of configuration and allows options to be entered. If you require all options, you must now select a smaller transaction storage number, or have Computrol supply additional memory.
23. Separate Audit :	If a separate line printer is used to record transactions as they occur, enter "Y" and only transactions will appear on the printer. If you enter "N", the PCU will generate a "Combined Audit". All communication output including commands will be echoed on both the control and audit channel.
24. Date (92/03/08):	Enter correct date using two digits each for year, month, day. Use a space between each. (e.g. 85 06 21 <RETURN>)
25. Time (15:12:59):	Enter correct time using two digits for hour, minute, second . A space or colon may separate characters.
26. Site Header #1 (): ***27. Site Header #2 ():*** ***28. Site Header #3 ():***	Enter up to 19 alphanumeric characters in each line to identify the ownership and location of this particular PCU. The identification will appear on all reports and on customer receipts if optional receipt printer is fitted.

e.g. ABC TRUCKING LTD. <RETURN>
FUEL SITE #12 <RETURN>
MELONVILLE, ON <RETURN>

NOTE: Report Listing Header will now show:

"---ABC TRUCKING LTD.---FUEL SITE #12---MELONVILLE, ON---"

Customer Receipts will show:

ABC TRUCKING LTD.
FUEL SITE #12
MELONVILLE, ON

SYSTEM PROMPT	MANAGER RESPONSE
29. Deauthorize all cards ?:	Enter "N" and all previously enabled cards will remain authorized. Enter "Y" and all previously enabled cards will be disabled along with any restrictions including P.I.N. and Fuel Limits.
30. Reset Transaction Table?:	Enter "N" and previously transactions will be retained. Enter "Y" and all previously recorded transactions will be unconditionally cleared. (No password required.)
31. Enter old "TALK" password: ***34. Enter old "CLEAR" password:*** ***37. Enter "COLD START" password:***	Enter the previously set password required to "sign on" to the PCU. The factory set passwords are: "T" for Talk Password (TPW) "C" for Clear Password (CPW) and "CS" for COLD START.
32. Enter new "TALK" password: ***34. Enter new "CLEAR" password:*** ***37. Enter "COLD START" password:***	You may now change the factory set passwords shown. Use any word or abbreviation up to 10 characters.
33. Verify new "TALK" password: ***36. Verify new "CLEAR" password:*** ***39. Verify "COLD START" word:***	Confirm your choice of new password by re-entering the same word or abbreviation. If the response to Prompt #33 is identical to the response to Prompt #32, the following message will appear.
"Password Changed"	If your response to Prompt #33 is not identical to the response to Prompt #32, the following message will appear:
"*Bad New Password****"***	Respond to #33 again. When responses do agree, the system will report:
"Configuration Terminated"	

Your system is now ready to operate. If you have configured a new PCU, you will now normally proceed with "Enabling" your user cards.

(see Section 3.6 - SYSTEM MANAGEMENT COMMANDS).

3.1 COMMAND OVERVIEW

After the configuration sequence has been completed, the system is ready to accept a series of commands which are utilized to enable and disable cards and pumps, to change certain variables such as Date, Time and Pump descriptions; and to produce listings of fuel transactions. To enter this information, the System Manager uses a series of command phrases at the control terminal. The System Management Commands perform five primary tasks or functions: Set, Print, Enable/Disable, List, and Upload/Download.

S(ET) Used to set up or edit information concerning the system's pump and card management.

P(RINT) Sends "Set" information and transaction data from the control terminal screen to a printer. Produces a hard copy for future reference.

E(NABLE)/ D(ISABLE) Used to designate which cards are "active" and "not active" and which pumps may be used.

L(IST) Used to create various Card Authorization and Transaction Reports required by the System Manager.

U(PLOAD)/ DO(WNLOAD) An option available on certain versions of PCU allows a controlling computer to quickly transfer Transaction and Authorization data in a condensed form from the PCU to mass storage on the control system. It also allows a quick restore or update of Authorization data from the control system to the PCU.

A number of subcommands are used in conjunction with each of these commands. For example, when the command S(ET) is used with the subcommand D(ATE), the System Manager can reset the current date of the Fuel Control System.

The System Manager uses the commands and subcommands to change information about pumps, cards and reports, and to generate reports about the transactions handled by the PCU. NOTE: At this point, the System Manager who is unfamiliar with the use of a computer keyboard should refer to Appendix A - KEYBOARD OPERATION for more information.

3.2 COMMAND DESCRIPTION

In the following section, each System Management Command will be explained in detail as to its function and use. Each command can be entered in full, and the condensed format is demonstrated where applicable (i.e. most commands can be initiated using only the first letter of the word, with the exception of TALK, CLEAR, GOODBYE, TPW, CPW and CSP). An example of how the command would appear on-screen is provided for quick reference.

Before activating any commands, it is necessary to sign-on to the control terminal. The SIGN-ON, SIGN-OFF, and HELP commands are explained first, as well as the MASTER RESET command, which allows the user to start the system over again from the beginning.

Then a complete Command Summary follows, listing each command, its meaning, and a first letter abbreviation where applicable. The commands are written in full with brackets around any of the non-essential letters.

3.3 GENERAL COMMANDS THE SIGN-ON COMMAND -- TALK

The System Manager must sign-on to the system by entering a command and a password. The command "TALK" is used to initiate communication between the control terminal and the PCU. The factory programmed password is "T". To sign on or "log on" to the system, follow the procedure below:

The system prompts: >

The System Manager enters: ***TALK <Return>***

The system responds: ***"TALK" Password:***

The System Manager enters: ***T <Return>***

The system responds: ******PASSWORD Accepted******

Incorrect password produces: ******Invalid Password******

NOTES: For security purposes, your password does not echo and will not appear on the screen or printer.
When an incorrect password is rejected, the System Manager must start the Sign-On sequence again. The Talk password may easily be changed at any time See S(ET) TPW, Section 3.4.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***TALK <Return>***
"TALK" Password:	***T <Return>***
******Password Accepted******	

THE SIGN-OFF COMMAND -- GOODBYE

To prevent unauthorized access into the Computrol Fuel Control System, the System Manager should sign off, or "log off", using the GOODBYE command. If the System Manager does not input information within a pre-set period of time, the system automatically signs off, and a "*****TIMEOUT*****" message is displayed. To sign-off, or "log off" the system, follow the procedures below:

The system prompts: >

The System Manager enters: ***GOODBYE <Return>***

The system responds: ***92/10/31 14:09:59***

The System Manager has now removed all access to the Computrol Fuel Control System. In order to re-establish contact between the control terminal and the PCU, the Sign-On command must be re-entered.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***GOODBYE <Return>***
92/10/31 14:09:59	

H(ELP)

The H(ELP) command produces a brief summary of all commands. As of September 1991 Computrol's standard version of software for the C600 and C600E offer the following format for the H(ELP) command.

The System Manager types: H(ELP) <Return> The system responds:

Set ***....Date***
....Time
....Header
....Pump
....TPW
....CPW
....VAriance
....Limits
....MPT
....NFT
Print ***....Date***
....Time
....Header
....Pump
....Status
....Version
....Options
....VAriance
....Limits

List Authorization All
.....Pump
.....Vehicle
.....Limits
...Card
...Transaction All
.....Number

Authorize Number

Enable..Pump
...Card
...System
...Vehicle

Disable ..Pump
....Card
...System
CLEAR
ZERO NUMBERS
GOODBYE
COLD START

COLD START -- MASTER RESET

There are some situations in which the PCU system has to be restarted and configured:

- at initial set-up of the unit for a site
- if requirements on the configuration parameters change
- if the memory board is exchanged
- after certain major hardware-service exercises

In these cases, the Master Reset must be used. There are two kinds of Master Reset available which will reset the software and start up the System Configuration routine. In the event that the PCU is operational and has to be reconfigured due to changed site requirements, the Software Master Reset can be performed using the COLD START command.

The System Manager enters: ***COLD START <Return>***

The system responds: ***"COLD START" password:***

The System Manager enters the cold start password, which is not echoed on- screen: ***[Password] (Factory password is CS <Return>)***

If the password is correct, the system responds: ***Computrol 600 - SR6.44 Configuration***

The System Manager may now change the configuration parameters. If the password is incorrect, the System Manager must begin again.

NOTE: The system can be restarted in all cases by using the hardware Master Reset (see Reference Manual provided with your system).

3.4 S(ET)

The S(ET) command enables the System Manager to alter some of the general information that was set up for the system at installation. This information can be re-defined by using the S(ET) command with any of the following subcommands.

S(ET) D(ATE) -- S D

This command must be used every time the system is re- started. The system's internal clock advances only when the system is running, therefore any time the System Manager has signed off, the clock reverts to installation date. The System Manager should routinely check to ensure correct date and time, particularly when generating reports to ensure validity. To set the current date, the System Manager follows the procedure below:

S(ET) D(ATE) -- S D (cont'd)

The system prompts: >

The System Manager responds: ***S(ET) D(ATE) <Return>***

The system responds: ***92/03/01***

The System Manager enters: ***92/10/31***

The system responds: ***92/10/31***

NOTES: The correct date must be entered in the format "YY/MM/DD" for Year, Month, Date, and each must be two characters (include 0s). Separate the digits using "/" or spaces.
If the correct date is already displayed when the system responds to the "S D" command, just press <Return> to accept this date.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) T(IME) <Return>***
Time (17:20:11):	***09:35:00 <Return>***
Time (09:35:00)	

S(ET) T(IME) -- S T

This command must be used every time the system is re- started. The System Manager should regularly check the System time, because all transactions are logged by this clock. The reports will be inaccurate if the date or time are incorrect. A hash mark (#) following the time indicates that the time is incorrect and must be altered. To change or retain the time of the system clock, follow the procedure below:

The system prompts: >

The System Manger enters: ***S(ET) T(IME) <Return>***

The system responds: ***Time+(17:20:11):***

If time correct, enter: ***<Return>***

To change time, enter: ***09:35:00 <Return>***

The system responds: ***Time (09:35:00)***

NOTE: The seconds do not need to be entered, as the system automatically starts the seconds at 00.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) T(IME) <Return>***
Time (17:20:11):	***09:35:00 <Return>***
Time (09:35:00)	

S(ET) H(EADER) -- S H

The header is the name keyed in by the System Manager to identify a particular site or pump island. The header appears on all transaction listings and receipts. On transaction listings, it is printed all on one line, and on receipts it is printed on three separate lines. When setting the header, the system requests the information in three lines; each line may be a maximum of 20 characters long.

The System Manager may wish to subdivide the header into three separate lines as has been done throughout this manual, or add the address etc. The System Manager may press <Return> to indicate a default, or the space bar and <Return> to erase and replace with a blank:

For example, if you type the following:

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) H(EADER)***

SITE HEADER #1 (----): ABC OIL COMPANY <Return>
SITE HEADER #2 (----): 1300 MAIN ST <Return>
SITE HEADER #3 (----): MELONVILLE <Return>

The system will print the following header on all customer receipts:

ABC OIL COMPANY
1300 MAIN ST
MELONVILLE

and the one below on all reports:

-----ABC OIL COMPANY - 1300 MAIN ST - MELONVILLE-----

In the example given in this manual, the site header is COMPUTROL TRUCKING LIMITED. To change or maintain the site header, follow the procedure below:

The System Manager enters:	***S(ET) H(EADER) <Return>***
The system responds with the current, if any, site header in brackets:	***Site Header #1 ( ):***
The System Manager types the desired site header:	***COMPUTROL <Return>***
The system responds:	***Site Header #2 ( ):***
System Manager Enters:	***TRUCKING <Return>***
The system responds:	***Site Header #3 ( ):***
System Manager enters:	***LIMITED <Return>***

Upon completion of this step, the Site Header has been entered and set for the configuration.

S(ET) H(EADER) -- S H (cont'd)

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***S(ET) H(EADER) <Return>***
Site Header #1 ( ):	***COMPUTROL <Return>***
Site Header #2 ( ):	***TRUCKING <Return>***
Site Header #3 ( ):	***LIMITED <Return>***

S(ET) P(UMP) -- S P

At installation, each pump is assigned a unique number which remains constant, although the pump name and pump-specific fuel limits may be changed with this command.

NOTE: The pumps are "un-locked" or "locked" by the PCU with the E(NABLE)/D(ISABLE) command. (See Section 1.4 for explanation of Pump Management and Sections 3.6 and 3.7 for E(NABLE) and D(ISABLE)).

The System Manager may change the pump name, fuel limit and accumulated total on one or a range of pumps as follows: ***S(ET) P(UMP) <Return>***

The system requests the pump number(s): ***Pump #'(s):***

The System Manager enters: ***1 <Return>***

The system prints the existing pump name in brackets: ***Pump Name (MARKED DIESEL):***

To change the pump name, the System Manager types the new name after the colon, followed by a <Return>. We suggest that the pump name be a number or the fuel type. The purpose is to further identify the unique pump numbers mentioned above. If the name is acceptable as it is, the System Manager presses the <Return> only: ***DIESEL <Return>***

The system prints the prompt "Pump Fuel Limit" with a number in brackets. This number indicates the limit to the amount of fuel which may be taken from that pump in one transaction. This may be shown in litres or gallons depending on your system. ***Pump Fuel Limit (500):***

S(ET) P(UMP) -- (cont'd)

If the bracketed number is the correct fuel limit for that pump, the System Manager presses <Return> to accept the printed value. The System Manager changes the fuel limit of the pump by typing the correct number followed by <Return>. ***200 <Return>***

The system then prints the prompt "Pump Total". This number shows the total accumulated amount of fuel already pumped from the pump in question since configuration or the last time this command was used, whichever came last. This number normally need not be changed except in situations when the pump has been bled or when the pump is refilled. ***Pump Total (3):***

In these instances, the System Manager must enter the new pump total. The system automatically changes this number as transactions occur. ***0 <Return>***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S P <Return>***
Pump #(s):	***1 <Return>***
Pump Name (MARKED DIESEL):	***DIESEL <Return>***
Pump Fuel Limit (500):	***200 <Return>***
Pump Total (3):	***0 <Return>***

S(ET) T(ALK) P(ASSWORD) -- S TPW

"TPW" stands for "Talk PassWord". This password must be entered to allow the system manager to "sign on" to the system. The "TPW" must be entered in short form. The factory-installed password is set. Note that this is "T" not "t". We recommend, for security purposes, that the System Manager change the password as soon as possible after assuming responsibility for the system. Periodic changes may be advisable for continued security.

The System Manager types:	***S(ET) TPW <Return>***
The system responds with:	***Enter old "TALK" Password:***
The System Manager enters:	***old password* ("T" to change the password after installation) *<Return>* or *T <Return>***
The system responds with:	***Enter new "TALK" Password:***
The System Manager enters:	***new password <Return>***

S(ET) T(ALK) P(ASSWORD) (cont'd)

The system requires the System Manager to enter the new password twice in order to ensure that no errors occur. The system responds with: ***Verify new "TALK" Password:***

The System Manager re-enters the new password: ***new Talk password <Return>***

If the second entry agrees with the first, the system prints: ***Password changed***

If the System Manager mistypes, the system does not accept the Talk Password and prompts: ***Enter New Talk Password:***

The system continues to print this prompt until the typed letters match the first entry. <Return> will break the cycle.

NOTES: This password may be up to 10 characters long. The new password is not echoed on the keyboard/printer. The system does not print the old password on the keyboard/printer for security reasons.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) TPW <Return>***
Enter old "TALK" Password: <Return>	
Enter new "TALK" Password: <Return>	
Verify new "TALK" Password: <Return>	
Password changed	

S(ET) C(LEAR) P(ASSWORD) -- S CPW

"CPW" stands for "Clear PassWord". This password is required to execute the CLEAR command, and also to D(ISABLE) S(YSTEM) (see Sections 3.8 and 3.7). The "CPW" must be entered in short form (see S(ET) TPW). The factory-installed password is usually set as "C". Note that this must be capital "C", not lower case "c".

It is recommended that the System Manager change the password as soon as possible after assuming responsibility for the system. Periodic changes are advisable for continued security.

The System Manager types the command: ***S(ET) CPW <Return>***
The system responds with: ***Enter old "CLEAR" Password:***
The System Manager types: ***old password (*"C" to change the password after installation*) <Return>***
The system responds with: ***Enter new "CLEAR" Password:***

S(ET) C(LEAR) P(ASSWORD) -- (cont'd)

The System Manager types a new password which may be up to 10 characters long: ***new password <Return>***

To verify the correct input of the new password, the system responds: ***Verify new "CLEAR" Password:***

The System Manager re- enters: ***new password <Return>***

If the second entry agrees with the first, the system prints: ***Password changed***

If an error is made, the system does not accept the second Clear Password and prompts: Enter New "CLEAR" Password: The system continues to print this prompt until the typed letters match the first entry. <Return> will break the cycle.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) CPW <Return>***
Enter old "CLEAR" Password:	***<Return>***
Enter new "CLEAR" Password:	***<Return>***
Verify new "CLEAR" Password:	***<Return>***
Password changed	

S(ET) C(OLD) S(TART) P(ASSWORD) -- S CSP

The Cold Start Password is represented by the characters "CSP". This password must be entered to allow the System Manager to reconfigure the system by executing the Software Master Reset. The factory-installed password is set as "CS". Note that this is capital "CS", not lower case "cs". It is recommended that the System Manager change the password as soon as possible after assuming responsibility for the system. Periodic changes may be advisable for continued security.

The System Manager types the command: ***S(ET) CSP <Return>***

The system responds with: ***Enter old "Cold Start" Password:***

The System Manager types: ***Old Password* ("CS" to change the password after installation <*Return*>.**

The system responds with: ***Enter new "Cold Start" Password:***

The System Manager types : ***New Password <Return>***

This password may be up to 10 characters in length. The system responds with: ***Verify new "Cold Start" Password:***

S(ET) C(OLD) S(TART) P(ASSWORD) -- (cont'd)

The System Manager re- enters: ***New Password <Return>***
If the second entry agrees with the first, the system prints: ***Password changed***

If an error is entered, the system does not accept the second Cold Start Password and prompts: ***Enter new "Cold Start" Password:***

The system continues to print this prompt until the typed letters match the first entry. <Return> will break the cycle.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) CSP <Return>***
Enter old "CSP" Password:	***old password <Return>***
Enter new "CSP" Password:	***new password <Return>***
Verify new "CSP" Password:	***new password <Return>***
Password changed	

S(ET) M(ISSING) P(ULSE) T(IMEOUT) -- S MPT

The Missing Pulse Timeout is represented by "MPT", and the abbreviated version of the command must be used. This response will be used when pumps are fitted with optional flow switches. When fuel is flowing, switches send signals to the PCU which monitors them in conjunction with pulser signals. Should a pulser fail, the PCU will detect flow signals only, and will automatically shut the pump off after the specific number of seconds input.

The System Manager enters: ***S(ET) MPT <Return>***
The system responds: ***Missing Pulse Timeout (0 to 10 seconds):***

The System Manager enters a number between 0 and 10, after which time the PCU will shut the pump off if a pulser has failed : ***10 <Return>***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) MPT <Return>***
Missing Pulse Timeout (0-10 seconds):	***10 <Return>***

S(ET) N(O) F(LOW) T(IMEOUT) -- S NFT

No Flow Timeout is represented by "NFT". The abbreviated version of the command must be used. This is the timeout period in seconds, after which the pump will automatically be turned off if fuel is not taken after fuelling had begun. The System Manager enters: S(ET) NFT <Return> The system responds: No-Flow Timeout (0 to 120 seconds): The System Manager enters a number between 0 and 120, representing the number of seconds after which time the pump will automatically stop dispensing fuel: 120 <Return>

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***S(ET) NFT <Return>***
No-Flow Timeout (0 to 120 seconds):	***120 (Return>***

S(ET) F(ORMAT) A(UDIT) -- S F A S(ET) F(ORMAT) O(PERATOR) -- S F O

Current Versions of Computrol C600 Software do not support these commands and so the description is removed from the manual.

S(ET) VA(RIANCE) -- S VA

There are a maximum of 9 variance codes 8 of which can be altered to represent the allowable increase in a vehicle's mileage between fuelling. The ninth code is code 0 which is used to indicate that the number entered is not checked. The code is assigned by using the E(NABLE) V(EHICLE) command. (See Section 3.6)

The System Manager enters:	***S(ET) VA(RIANCE) <Return>***
The system asks which codes:	***Code # (s) :***
The System Manager may specify one or more or all codes:	***1-2 <Return>***
The system responds by asking what variance the first code will represent:	***Code = 1 Variance =***
The System Manager will enter the value chosen:	***100<Return>***
The system will ask what variance the next code will represent:	***Code = 2 Variance =***
And so on...	

S(ET) VA(RIANCE) -- (cont'd)

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***S VA <Return>***
Code # (s) :	***1-2 <Return>***
Code = 1 Variance =	***100 <Return>***
Code = 2 Variance =	***200 <Return>***
etc... >	

S(ET) L(IMITS) -- S L

There are a maximum of 16 fuel limit numbers which can be established and changed with this command. These are assigned either to the individual cards or with card ranges using the E(NABLE) C(ARD) command (see Section 3.6). These limits indicate the maximum amount of fuel which may be taken from a pump in one transaction by the card holder. This figure may represent gallons or litres depending on your system. Note that pumps also have fuel limits as established with the S(ET) P(UMP) command. The PCU is governed by whichever limit is lowest and terminates transactions when that limit is reached. The System Manager sets the fuel limits represented by numbers 1 to 16 as follows.

NOTE: The fuel limits are initialized to zero at configuration time when all cards are de-authorized.

The System Manager enters:	***S(ET) L(IMITS) <Return>***
The system asks which limit number or numbers:	***Limit #(s):***
The System Manager may specify an individual limit number or range of limit numbers:	***1 <Return>***
The system asks what the first fuel limit is to be:	***1 Fuel Limit =***
The System Manager types the appropriate number:	***100 <Return>***

This cycle should be repeated for each of the numbers 1 to 16.

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***S L <Return>***
Limit #(s):	***1 <Return>***
1 Fuel Limit =	***100 <Return>***
>	***S L <Return>***
Limit #(s):	***2-16 <Return>***
2 Fuel Limit =	***100 <Return>***
3 Fuel Limit =	***200 <Return> etc.***

3.5 PRINT

The P(RINT) command is used to get a printout of the current values of the variables which have been set with the S(ET) command or to get the current status of some system parameters.

P(RINT) D(ATE) -- P D

The System Manager generates a printout of the current date in the system with the P(RINT) D(ATE) command.

The System Manager types: ***P(RINT) D(ATE) <Return>***
The system responds with the day of the week, date and the time in yy/mm/dd format: ***92/02/03 17:39:33***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***P(RINT) D(ATE) <Return>***
92/03/12 17:39:33	

P(RINT) T(IME) -- P T

The System Manager generates a printout of the current system time using the Print Time command.

The System Manager types: ***P(RINT) T(IME) <Return>***

The system responds with the time in hh:mm:ss: ***17:39:33***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***P(RINT) T(IME) <Return>***
17:39:33	

P(RINT) H(EADER) -- P H

This command produces a printout of the header as entered using the S(ET) H(EADER) command. The system manager requests a printout of the header with the P(RINT) H(EADER) command.

The System Manager types: ***P(RINT) H(EADER) <Return>***

The system responds with the header as it appears for both the receipts and for the listings:

For Receipts: ABC OIL COMPANY
1300 MAIN ST
MELONVILLE
For Listings: -----ABC OIL COMPANY-1300 MAIN ST-MELONVILLE-----

P(RINT) P(UMP) -- P P

This command creates a printout which describes each pump by its variables, i.e. its status, the total amount of fuel taken from the pump since configuration and the amount taken since the transaction table was last cleared. The System Manager requests a printout for a pump or a range of pumps with the P(RINT) P(UMP) command using the following procedure:

The System Manager enters: ***P(rint)P(ump)<Return>***

The system asks which pump or pumps: ***Pumps #'(s):***

The System Manager responds with the pump number(s): ***1-3 <Return>***

The system creates a printout similar to the following:

92/09/07 08:40:15 ***PAGE 1***

-----COMPUTROL-SYSTEMS-LIMITED-----

No.	*Pump Name*	*Limit*	*Status*	*Billing Total*	*Pump Total*
1	*DIESEL*	*400*	*INACTIVE*	*1056. 5*	*34297.2*
2	*MARKED DIESEL*	*50*	*FLOWING*	*948.1*	*23174.1*
3	*REGULAR GAS 100*	*DISABLED*	*299.2*	*299.2*	
4	*UNLEADED GAS*	*100*	*INACTIVE*	*509.3*	*509.3*

The above printout is interpreted as follows:
a) Pump No. is the hard-wired position determined at installation and cannot be changed here.
b) Pump Name and Limit are set with the S(ET) P(UMP) command. The System Manager may choose any 20 character name to identify a pump. The limit is the total amount of fuel in litres or gallons (depending on your system) which can be taken from the pump in one fuelling transaction.
c) Status indicates whether the pump is inoperative or operative as established with the D(ISABLE) P(UMP) or E(NABLE) P(UMP) commands (see Sections 3.6 and 3.7). DISABLED means that the pump is temporarily out of service. If the pump is enabled Status shows as INACTIVE if the pump is not being used at the time the P(RINT) P(UMP) command is given, or various other states of activity if it is.
d) The Billing Total is the total amount of fuel taken from the pump since the system was configured or the S(ET) P(UMP) command was given, whichever came last. This includes the amount shown in the Pump Total column which is the amount of fuel taken since the System Manager last used the CLEAR command. (see Section 3.8 to clear the transaction table)

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***P(RINT) P(UMP) <Return>***
Pump #'(s):	***1-3 <Return>***

P(RINT) S(TATUS) -- P S

This command generates a printout of the current status of some of the system variables and parameters. The system manager creates this printout using the P(RINT) S(TATUS) command in the following procedure.

The System Manager enters: ***P(RINT) S(TATUS) <Return>***

The system responds with a printout similar to the following:

-----COMPUTROL-SYSTEMS-LIMITED-----
93/09/07 08:45:15
Max. Number of Transactions : 2000
Number of Transactions Done : 2
Number of System Powerups : 0
Number of Restarts at Zero : 2
Memory size in Kilo Bytes : 32
System : ENABLED

NOTES: a) The maximum number of transactions is after configuration and depends on available memory space.

b) The Number of Transactions Done indicates the number of transactions which have occurred since configuration or the last CLEAR command, whichever occurred last. The difference between the maximum number of transactions and the number of transactions done equals the number of possible transactions left in the transaction table. When these two numbers are equal, the system prevents further transactions. The message "CALL DISTRIBUTOR" will show on the PCU's display. At this point, the CLEAR command must be executed before any fuelling transactions can occur.

c) The Number of System Powerups and Restarts at Zero are diagnostic tools for system maintenance personnel. These two figures indicate abnormal transactions and are included in the transactions done .

d) The memory size in Kilobytes indicates the actual physical memory size in the system. The memory size required for the operation of the system varies and depends on the selected configuration parameters. This memory size has to be equal or less than the actual physical memory size. The required memory can be viewed using the P(rint) O(ptions) command.

e) In the "Real Time Operation", the system can be in either "Operational Mode" (Enabled), or "Idle Mode" (Disabled). In the idle mode, all functions of the PCU are disabled except for the control console functions. The fuelling is disabled unless the bypass mechanism is used, and the display shows "WAIT-SERVICING". (See Section 3.7, D(ISABLE) S(YSTEM) command).

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***P(RINT) S(TATUS) <Return>***

P(RINT) V(ERSION) -- P V

This command generates a printout of the system specific information regarding software release number, card series and PROM signature. It is useful for system maintenance personnel. The system manager creates this printout with the P(RINT) V(ERSION) command using the following procedure.

The System Manager types: ***P(RINT) V(ERSION) <Return>***

The system responds with a printout similar to the following:

C600SR4.5 Card Series: 201 PROM signature: 7B87

This indicates that the software version is SR4.5, the card series is 201 and the PROM signature is 7B87.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***P(RINT) V(ERSION) <Return>***

C600SX2.0 Card Series: 201 PROM signature: 7B87

P(RINT) O(PTIONS) -- P O

This command prints the system options, and the number of pumps entered at system configuration time. The memory size required for the operation of the system varies and depends on the configuration parameters of the system. It has to be equal or less than the actual physical memory of the system which can be viewed using the Print Status command.

The printout is obtained as follows.

The System Manager enters: ***P O <Return>***

The system responds:

Card System : SINGLE (or DUAL)
Odometer Entry : YES (or NO)
Unit # Entry : NO (or YES)
P.I.N. Control : YES (or NO)
Pump Authorization : YES (or NO)
Fuel Limits per Card : YES (or NO)
Separate Audit Trail : NO (or YES)
Receipt Printer : YES (or NO)
Number of Pumps : 3

Memory Size required (in Kilo Bytes): 32
No-Flow Timeout (in seconds): 120

NOTE: The No-Flow Timeout is the period of time in seconds allowed before the pump is turned off if fuel is not taken after fuelling has begun. It is settable within 0 to 120 seconds using the S(ET) NFT command (see Section 3.4).

P(RINT) O(PTIONS) -- P O (cont'd)

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***P O <Return>***

P(RINT) VA(RIANCE)

This command generates a printout of the Variance Codes used in the Odometer Checking feature. Since the Variance Codes are settable the System Manager may wish to examine the value attached to each code.

The System Manager enters: ***P(RINT) VA(RIANCE) <Return>***

The system responds with a printout similar to the following:
Code = 1 Variance = 50
Code = 2 Variance = 100
Code = 3 Variance = 200
. . . . . .
. . . . . .
Code = 9 Variance = 900

P(RINT) L(IMITS) -- P L

This command generates a printout of an individual or range of pump limit numbers and their associated fuel limits as set with the S(ET) commands.

The system manager enters: ***P(RINT) L(IMIT) <Return>***

The system asks which limit number(s): ***Limit #'(s):***

The System Manager responds with the number or range of numbers. If no numbers are entered, all 16 limits are printed. ***14 <Return>***

The system prints each fuel limit number and the fuel limit associated with it. The figures represent gallons or litres depending on your system:

1 Fuel Limit = 80
2 Fuel Limit = 90
3 Fuel Limit = 100
. . . . . .
15 Fuel Limit = 500

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***P L <Return>***

3.6 A(UTHORIZE) N(UMBER)

Computrol's growing software and system capabilities has made it possible to offer a new method of entering card authorization tables in the PCU. The A(UTHORIZE) N(UMBER) or AN command provides a fast and easy way to keypunch authorization data into the system. The command is designed to keep keystrokes to a minimum for manual entry and make computerized automation of card list transfers from a PC computer very easy to program.

The command line used is: ***A(UTHORIZE) N(UMBER) <Return>***

The system responds with: ***CCCCC\T\P\HHHHHHHH\LL\V\OOOOOOO***

Where:

CCCCC - ***C***ard # or number to be authorized.
T - ***T***ypes of authorization; O=operator, V=vehicle or B=both
P - ***P***IN is used Yes=Y or No=N (applies to operator numbers).
HHHHHHHH -***H***ose positions 1-8 for which a vehicle number is valid.
LL - ***L***imit 1-16 for the vehicle number authorized. (Section 1.4.2.4)
V - ***V***Ariance code 0-9, for the vehicles. (Section 1.4.2.6)
OOOOOO - ***O***dometer reading for the vehicle; used for odometer checking. (Section 1.4.2.6)
\ - is field separator and is required to fill fields not applicable.
The cursor will appear under the first C in CCCCC ready for typing the entry.

NOTES: a) The same command is used regardless of software, capabilities or configuration of PCU.
b) All parameters of authorization are entered on a single line. Another line (for another card/number) i is entered right after the first and when done the System Manager uses the Enter or Return key to terminate the command.
c) When a specific parameter is not required it is left out as long as field separator "\" is placed. Operators for example have PINs but no hose or limit or odometer checking parameters. These pertain to a vehicle only except in a single card system.

The System Manager authorizes a card or number following the example outlined as follows :

The System Manager types: ***A(UTHORIZE) N(UMBER) <Return>***

The system responds with: ***CCCCC\T\P\HHHHHHHH\LL\V\OOOOOOO***

The System Manager wishes to make card
1234 valid as an Operator with PIN: ***1234\O\Y\ \ \ \ \ <Return>***

```
|     | |____  means Yes for PIN
|     |_____  means Operator
|_________  1234 is Card #
```

NOTE: Hoses, Limits VAriance and Odometer are not applicable to an Operator.

A(UTHORIZE) N(UMBER) (cont'd)

The System Manager wishes to make 54321 valid as a vehicle using pump 1,3 and 4 only, using card limit 16, variance code 1 and with a current meter reading of 1234567: ***54321\V\ \1011\16\1\1234567 <Return>***

- ***54321*** Card# to be authorized is 54321
- ***V*** Type is Vehicle
- ****** PIN field is skipped (not used)
- ***1011*** the vehicle uses hoses 1,3 and 4 not 2
- ***16*** is the limit for fuelling the vehicle
- ***1*** is the VAriance code
- ***1234567*** is the odometer reading

NOTE: The System Manager terminates the command with: ***<Return>***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***A N <Return>***
CCCCC\T\P\HHHHHHHH\LL\V\OOOOOOO	***1234\O\Y\ \ \ \ \ <Return>***
ENTERED	***54321\V\\ 10000001\16\1\1234567 <Return>***
<Return>	

A N COMMAND FOR FLEET PCUS

For Fleet 600 and Fleet 300 Units the features using Limits, Variance and Odometer are not available. The Command Prompt is as follows:

The command line used is: ***A(UTHORIZE) N(UMBER) <Return>***

The system responds with: ***CCCCC\T\P\HHHH\ \ ***

Where:

- ***CCCCC*** - ***C***ard # or number to be authorized.
- ***T*** - ***T***ypes of authorization; O=operator, V=vehicle or B=both
- ***P*** - ***P***IN is used Y=Yes or N=No (applies to operator numbers)
- ***HHHH*** - ***H***ose positions 1-4 for which a vehicle number is valid.
- ****** - is field separator and is required to fill fields not applicable.

3.7 E(NABLE)

The E(NABLE) commands are used in conjunction with the P(UMP) and C(ARD) subcommands to activate the fuel pumps and Computrol cards in the system. Enabled pumps may be used to obtain fuel with an enabled COMPUTROL card. Cards may be enabled with their own restrictions as to card type, pumps, fuel limits and P.I.N.

NOTE: When enabling cards, all questions must be answered.

E(NABLE) P(UMP) -- E P

This command brings a pump or range of pumps under the control of the PCU. This means a record of all fuel transactions at these pumps is kept. All pumps are E(NABLED) when a system is newly configured.

The System Manager can E(NABLE) a P(UMP) with the following procedure.

The System Manager types:	***E(NABLE) P(UMP) <Return>***
The system asks which pump or range of pumps:	***Pumps #(s):***
The System Manager responds with the pump number or range of pump numbers:	***1-2 <Return>***
If this pump(s) is disabled the system prints:	***Status Changed***
If this pump(s) is already enabled, the system prints:	***Pump(s) Enabled***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***E(NABLE) P(UMP) <Return>***
Pump #'(s)	***1-2 <Return>***

E(NABLE) C(ARD) -- E C

This command authorizes a card or range of cards to be used for activating pumps controlled by the system. Card numbers may be entered individually or in blocks. Individual cards or ranges of cards must be separated by spaces or commas: e.g. E C 4002 4005-4010 4015-4020 <Return>.

NOTES:a) All parameters must be entered. Incorrect input will generate a corresponding error message.

b) This command is affected by the options configured into the system at configuration time. The system requests additional information if two cards and/or P.I.N.s and pump authorizations are used.

c) A new fuel limit overrides the previous fuel limit. However, an error message "Already Enabled with Different Parameters" is given if the P.I.N., Operator or Both options are different. In this case, the card(s) first must be disabled and then re-enabled with the new parameters.

d) If a large number of cards are to be enabled with one E(NABLE) command, the system prints an X for every 250 cards processed, to indicate that it is still operating.

The System Manager enables a card or range of cards following the procedure outlined below.

The System Manager types:	***E(NABLE) C(ARD) <Return>***
The system asks which card or range of cards:	***Card #'(s):***
The System Manager responds with the card number or numbers:	***1274-1276 <Return>***
In a two-card system, the system asks :	***Operator, Vehicle or Both***

E(NABLE) C(ARD) (cont'd)

The System Manager types "O" for Operator, "V" for Vehicle and "B" for Both. ***B <Return>***

If the system uses the P.I.N. option, it then asks whether or not this option is required with the card(s). **** PIN Enabled (YES/NO):***

The System Manager responds with Y or N as appropriate. ***Y <Return>***

If the system uses the fuel limit option, it then asks for the fuel limit number that is to be associated with the card. ***Fuel Limit # =***

The System Manager responds with the appropriate number, 1 to 16, as established with the S(ET) L(IMITS) command: ***1 <Return>***

If the system includes the pump authorization option, it then asks for the pump number(s) that the card(s) is to be authorized for. **** Pump #'(s):***

The System Manager responds with the pump number or numbers: ***1-2 <Return>***

If this card(s) is already enabled for a different card or P.I.N. option the system prints:
Card # XXXXX Already Enabled with Different Parameters

NOTE: * In a two-card system, this applies only to Operator and Both cards.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	**E(NABLE) C(ARD) <Return>**
Card #'(s):	**1274-1276 <Return>**
Operator, Vehicle or Both	**B <Return>**
PIN Enabled (YES/NO):	**Y <Return>**
Fuel Limit # =	**1 <Return>**
Pump #'(s):	**1-2 <Return>**

E(NABLE) S(YSTEM) -- E S

This command resumes normal operation of the system after it has been disabled using the D(ISABLE) S(YSTEM) command (see Section 3.7).

The System Manager types: **E(NABLE) S(YSTEM) <Return>**

The system reponds: >

This indicates that the command has been accepted, and that normal operation of the system will now begin.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***E(NABLE) S(YSTEM) <Return>***

E(NABLE) V(EHICLE) -- E V

This command is used in conjunction with the Odometer Checking feature and provides the System Manager with the ability to associated each vehicle card with a VAriance code and an odometer reading.

The System Manager types: ***E(NABLE) V(EHICLE) <Return>***

The system asks which card: ***Card #'(s):***

The System Manager responds with the card number for the vehicle in question: ***42001 <Return>***

The system asks what Variance Code is to be assigned and shows the current code: ***Code #(0):***

The System Manager responds with the appropriate code number: ***1 <Return>***

If a Code other than "0" is entered the system asks what meter reading should be used for comparison: ***Odom #(123456):***

The System Manager responds with the new reading or just <Return> if the reading shown is correct: ***234567 <Return>***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***E(NABLE) V(EHICLE) <Return>***
Card #'(s):	***42333 <Return>***
Code #(0):	***1 <Return>***
Odom #(0):	***234567 <Return>***

3.8 D(ISABLE)

The D(ISABLE) commands for P(UMP) and C(ARD) prevent the specified pumps and cards from being controlled by the Computrol PCU, and therefore they cannot be used.

D(ISABLE) P(UMP) -- D P

This command shuts down one pump or a range of pumps. This means that fuel cannot be taken from the pump except with the by-pass mechanism. If a driver attempts to do so, the PCU displays the message "PUMP DISABLED". A newly configured system has all pumps enabled, and a D(ISABLE) P(UMP) must be performed immediately if one or more pumps are to be removed from the system.

The System Manager can disable a pump using the following procedure.

The System Manager types:	***D(ISABLE) P(UMP) <Return>***
The system asks which pump or range of pumps:	***Pump #'(s):***
The System Manager responds with the pump number or range of pump numbers:	***1-2 <Return>***
If the pump(s) is already disabled, the system prints:	***Already Disabled***
If the pump(s) to be disabled are in use, the system prints:	***Cannot be Disabled When In Use***
If the pump(s) is enabled, and not in use the system prints:	***Status Changed***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***D(ISABLE) P(UMP) <Return>***
Pump #'(s)	***1-2 <Return>***

D(ISABLE) C(ARD) -- D C

This command de-authorizes a card or cards and/or a range or ranges of cards. These may be entered at the same time on one line separated with spaces or commas, e.g. D C 4000 4002 4005-4010 4015-4020 <Return>. The system prints an "X" for every 250 cards disabled, to show that it is still operating.

To disable a card or range of cards, the System Manager follows the procedure outlined below:

The System Manager enters:	***D(ISABLE) C(ARD) <Return>***
The system asks which card number or numbers:	***Card #'(s):***
The System Manager responds with the card number or numbers:	***1274-1276 <Return>***

D(ISABLE) C(ARD) -- D C(cont'd)

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***D(ISABLE) C(ARD) <Return>***
Card #'(s)	***1274-1276 <Return>***

D(ISABLE) S(YSTEM) -- D S

This command puts the system in "Idle mode", where all functions of the system are disabled except for the Operator Console functions. The fuelling is disabled unless the bypass mechanism is used. In the bypass situation, all transactions are recorded as "MANUAL", even if the system is in the Idle mode.

After issuing the command, the PCU displays "WAIT-SERVICING" and stops accepting cards (inhibits initiation of a new transaction). It then checks if there are any transactions in progress. If so, the system sends the message "WAITING" to the Operator Console every five seconds until the last transaction is complete. Upon termination of the last transaction, the system prints "SYSTEM DISABLED". The status of the system can be viewed using the P(RINT) S(TATUS) command (see Section 3.5).

The D(ISABLE) S(YSTEM) command should be used each time the "CLEAR" transactions operation is performed (see Section 3.8). Note that the Clear Password selected in S(ET) CPW (see Section 3.4) must be entered before the system is disabled. The DO(WNLOAD) operations can be performed only if the system is in the Idle mode.

The System Manager types: ***D(ISABLE) S(YSTEM) <Return>***

The system responds: ***"DISABLE SYSTEM" password:***

The System Manager enters the Disable System password, which is the same password that is used for initiating the CLEAR command (see Clear Password). ***Password <Return>***

If there are any transactions still in progress, the system responds with: ***WAITING***

When all transactions have been checked, the system displays: ***SYSTEM DISABLED***

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***D(ISABLE) S(YSTEM) <Return>***
DISABLE SYSTEM" password:	***<Return>***
SYSTEM DISABLED or	
WAITING ,.. WAITING ,...SYSTEM DISABLED	

3.9 ZERO NUMBERS

When using random numbers for either vehicles or operators certain conditions may make it necessary to delete the whole table. This might be required when a new downloaded table is ready top send.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***Z(ero) N(umbers)***
CLEAR Password:	***System Manager types: Password***

3.10 CLEAR

The Fuel Control System records each fuel transaction in its memory. Periodically, this memory must be emptied or "Cleared" after listing all transactions on the printer. The CLEAR command will not be accepted unless all transactions have been listed. If this is not done, the memory eventually becomes full. When this happens, the PCU displays "CALL DISTRIBUTOR" on its display and discontinues fuelling until the memory is "Cleared".

The CLEAR command resets the transaction table to zero. The maximum and accumulated number of transactions in the system are output using the P(RINT) S(TATUS) command (see Section 3.5).

When the CLEAR command is executed, there should be no transactions in progress. A situation where the CLEAR command is performed at the same time as a transaction is being terminated could cause the transaction to be cleared before it has been listed.

To prevent this, the command D(ISABLE) P(UMP) for all the pumps or the D(ISABLE) S(YSTEM) command has to be executed prior to the CLEAR command (see Section 3.7). After the CLEARing of the transactions, E(NABLE) P(UMP)s or S(YSTEM) should be executed.

After the CLEAR command has been given, past transactions are no longer accessible with the LIST commands. For this reason, the system will not execute the CLEAR command unless all transactions have been LISTed first. The system transaction table is cleared by the following procedure.

The System Manager enters:	**CLEAR <Return>**
The system asks for the CLEAR Password:	***"CLEAR: Password:***
The System manager types the password:	***Clear Password <Return>***
If there are transactions which have not been LISTed the system responds with:	***Transactions not all listed***

The System Manager must then use one of the LIST commands (see Section 4.0) to obtain a printout of all transactions. If all transactions have been listed, the system obeys the CLEAR command, and prints the current date and time.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***CLEAR <Return>***
"CLEAR" Password:	***Clear Password <Return>***
	92\03\23 10:32:32

4.0 REPORT GENERATION COMMANDS

4.1 LIST AUTHORIZATION REPORTS

The Fuel Control System generates two types of authorization reports, one showing the options and the other showing the fuel limit numbers allocated to each card. These reports, using the L(IST) command, show which cards are enabled, and what attributes have been allocated to them by use of the E(NABLE) C(ARD) commands.

The system prints the date, time and page number on each report. The heading is determined by the S(ET) H(EADER) command and the format by the S(ET) F(ORMAT) commands. These commands are detailed in Section 3, SYSTEM MANAGEMENT COMMANDS.

Note that:
1. "ESC" cancels or aborts a listing.
2. CTRL-S temporarily stops a listing.
3. CTRL-Q restarts temporarily stopped listings.

L(IST) A(UTHORIZATION) N(UMBER) -- L A N

If your system uses the AN command the list of authorized cards or numbers will be in a very different format from reports using the ENABLE commands. The L A N report format is virtually identical to the format in which the data was input.

The PCU asks the System Manager to specify the first number to list and lists that number and all subsequent numbers until the list is aborted (ESC) or completed.

If the system accepts Random numbers from 1 -99999 for either the vehicle or operator card/number the numbers will be stored in order of entry. This not a concern for System Managers using a computer to transfer or refresh the authorizations automatically.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
System Manager types:	***L A N <Return>***
The system responds with:	***CCCCC\T\P\HHHHHHHH\LL\V\OOOOOOO***
	Card#=
The System Manager types in the starting number to query:	***100***
The system responds with a list starting at that number and continuing until the <ESC> key aborts the listing:	***100\O\ \ \ \ \ ***
	***102\O\ \ \ \ \ ***
	130\V\ \11110000\02\2\ 1112
	140\V\ \11110000\03\3\ 1234
	Aborted

LIST AUTHORIZATION REPORTS (cont'd)

For Systems using the ENABLE CARD command there are several symbols to be familiar with before looking at the reports. IN A ONE-CARD SYSTEM:
E = an Enabled Operator Card
P = an Enabled Operator Card with a P.I.N.

IN A TWO-CARD SYSTEM:
O = an Enabled Operator Card
P = an Enabled Operator Card with a P.I.N.
V = a Vehicle Card
B = a Card that represents both Operator and Vehicle
Q = an Enabled Both Card with a P.I.N.

IN ALL SYSTEMS USING THE ENABLE FORMAT:
"." means that the card number is DISABLED.

A blank indicates that the number is outside the requested range.

LIST AUTHORIZATION ALL -- L A A

This command lists all the card numbers in the form of a matrix or grid. The symbols . , E P Q O V and B indicate the status of the card as shown above. The system manager asks for a list of the status of all card authorizations with the L A A command.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***L A A <Return>***

92/09/07 08:36:32 ***PAGE 1***

-----COMPUTROL-SYSTEMS-LIMITED-----

Card Authorizations

Card	***0123456789***	***0123456789***	***0123456789***	***0123456789***	***0123456789***
00000	. . . .	. . . . .	. . . . . .	. . . . . .	. . . . .
00050	***EEEEEEEE***	***EEEEEEEEE***	***EEEEEEEEE***	***EEEEEEEEE***	***EEEEEEEEE***
00100	. . . .	. . . . .	. . . . .	. . . . .	. . . . .
0015	. . . .	. . . . .	. . . . .	. . . . .	. . . . .
00200	. . . .	. . . ***EEEE*** . .	. .***EEEEE*** ..	***EEEEEEEEE***	***EEEEEE*** . .

The card numbers are shown in the left hand column in groups of fifty. The first line of output, which in this case is all dots (.), goes from card number 00000 to 00049 and the second line, which in this case is all "E"s, goes from card number 00050 to 00099. The numbers in the top line are in five groups of ten, each group representing 10 consecutive card numbers.

The correct symbol may therefore be found by first identifying the required group of fifty card numbers in the left hand column; this tells you the row to look on. You then identify the last two digits of the card number along the top and then read down until you get to the row you identified previously. Where row and column cross you will find the symbol for that particular card number. The symbols are explained fully in GENERAL, above.

LIST AUTHORIZATION REPORTS (cont'd)

The above report shows that there are 100 cards in the series -the first 50 of which are disabled and the last 50 of which are enabled. In practice the number of cards could be up to 50,000. This is a one-card system because the enabled cards are shown with an "E" rather than a "O", "V" or "B". The system may or may not have the P.I.N. option; however if it does none of the above cards are enabled with it.

L(IST) A(UTHORIZATION) P(UMP) -- L A P

This command lists the authorized cards by pump number in a system with the pump authorization option. The System Manager uses this command to find out which cards are authorized for a particular pump. The System Manager asks for a list of the authorized card numbers for specific pump numbers with the L A P command. In a system with no pump authorization option, i.e. all pumps are accessible to all cards, the pump number may be any of the valid pump numbers and the same report would be listed for each pump.

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	*L A P <Return>*
Pump #'(s):	*1 <Return>*
Card #'(s)	*300-570 <Return>*

```
92/10/12 10:30:19                                   PAGE 1
                -----COMPUTROL-SYSTEMS-LIMITED-----
                     Card Authorizations for Pump 01
Card    0123456789    0123456789    0123456789    0123456789    0123456789
00300   ..........    ..........    ..........    ..........    ..........
00350   ..........    ..........    ..........    ..........    ..........
00400   BBBBBBBBBB    BBBBBBBBB     BBBBBBBBB     BBBBBBBBB     BBBBBBBB
00450   B000000000000 000000000000  000000000000  000000000000  0000000000
00500   0VVVVVVVVVV   VVVVVVVVVV    VVVVVVVVVV    VVVVVVVVVV    VVVVVVVV
00550   V. ........ ..........
```

This report is interpreted in the same way as the L A A command. In this instance, the System Manager has only asked for one pump. If more than one is requested, they are listed in sequential order one below the other with several lines between separate pump numbers and each with the heading "Card Authorizations for Pump XX".

The above report shows that the full range of cards is 300 to 570 and of those, 401 to 550 are enabled at pump 01. Of those 50 cards, the first 50 are Both cards, the second 50 are Operator cards and the last 50 are Vehicle cards.

L(IST) A(UTHORIZATION) L(IMITS) -- L A L

This command lists the cards and prints the fuel limit number that is assigned for each. The System Manager asks for a list of authorized card numbers and their associated fuel limit numbers with the L A L command.

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***L A L <Return>***
Card #'(s):	***103-130, 139 <Return>***

92/12/09 17:20:19 ***PAGE 1***

-----COMPUTROL-SYSTEMS-LIMITED-----

Card	***00***	***01***	***02***	***03***	***04***	***05***	***06***	***07***	***08***	***09***	***00***	***01***	***02***	***03***	***04***	***05***	***06***	***07***	***08***	***09***
00100				***12***	***12***	***12***	***12***	***12***	***12***	***13***	***16***	***16***	***16***	***15***	***15***	***15***	***15***	***00***	***00***	***00***
00120	***15***	***15***	***15***	***15***	***15***	***15***	***15***	***15***	***15***	***15***	***15***									***11***

This report is interpreted similarly to the L A A report. The card numbers are listed in the left hand column in groups of twenty. The first line of output goes from card number 0100 to 0119. The two-digit number shown under each of the card numbers shows the applicable fuel limit number. These numbers range from 01 to 16 as established with the S(ET) L(IMITS) command, see Section 3.4.

If a card is not enabled, the symbol ".." is printed. If a card number belongs to an Operator card in a two-card system, then "OP" is printed because it cannot have a fuel limit attached to it.

L(IST) C(ARD) -- L C

This command lists the card range for your system. The system manager asks for the card range with the L C command.

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***L C <Return>***
Card Range =	***1000 - 1900***

This means that the entire range of cards possible in your system is number 1000 to 1900 inclusive. This is the number of cards which may be enabled or disabled and is the maximum in your system.

L(IST) R(ANGE) -- L R

This command lists the card and number range for your system. The system manager asks for the card range with the L R command. This command is used in conjunction with the new AN command and random authorization tables.

L(IST) R(ANGE) -- L R (cont'd)

EXAMPLE

SYSTEM PROMPT	**SYSTEM MANAGER RESPONSE**
>	***L R <Return>***

Card Range = 1000 - 1900 , Number Range = 1-99999, Qty of Numbers = 10000

This means that the entire range of cards possible in your system is number 1000 to 1900 inclusive and that numbers are used for Operators of Vehicles of which 10000 can be used from a 100000 range of numbers. This is the number of cards which may be enabled or disabled and is the maximum in your system.

4.2 LIST TRANSACTION REPORTS

The Fuel Control System is capable of generating six different transaction reports. These are all based on the record of each transaction, successful or not, stored in the transaction table of the PCU's memory and are obtained using the L(IST) commands.

The PCU automatically prints a record of each transaction on the audit terminal. All the reports are variations on this printed record, but differing in format and content. For example, the system manager may ask for a report of all transactions by card number 1000. The L(IST) commands allow the System Manager to generate reports that exclude unnecessary information. All reports list transactions in chronological order.

The system prints the date, time and page number on each report. The heading is a function of the S(ET) H(EADER) command and the format is a function of the S(ET) F(ORMAT) commands. These commands are detailed in Section 3.4, S(ET).

Note that:

1. "ESC" cancels or aborts a listing.
2. CTRL-S temporarily stops a listing.
3. CTRL-Q restarts temporarily stopped listings.

Before looking at the various sample reports which follow, there are several symbols with which you should be familiar. These are:

1. The number 65535 under the CARD 1 column indicates a diagnostic transaction. Refer to Appendix A for explanations of diagnostic messages.

2. The hash mark (#) after the date and time in a transaction report means the system has been re-started after a power outage without the date and time being corrected. The system manager should re-set the date and time with the S(ET) D(ATE) and S(ET) T(IME) commands, Section 3.4.

L(IST) T(RANSACTION) A(LL) -- L T A

This command lists the contents of the transaction table and its use is recommended before giving the CLEAR command, regardless of whether or not the transactions have been listed in other forms. L T A also includes "diagnostic" transactions which are system or user errors, see Appendix A. The system manager uses the L T A command as follows:

L(IST) T(RANSACTIONS) A(LL) (cont'd)

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	*L T A <Return>*

92/12/08 07:30:12 *PAGE 1*

----------COMPUTROL-SYSTEMS-LIMITED----------

TRN	*# TERM*	*DATE*	*TIME*	*PUMP #-NAME*	*CARD 1*	*FUEL(L)*
1	*NORMAL*	*92/12/08*	*01:00*	*2-MARKED DIESEL*	*16651*	*65.8*
2	*TIMEOUT*	*92/12/08*	*01:00*	*1-DIESEL*	*26392*	*0.0*
3	*RESTRT 0*	*92/12/08*	*01:02*	*9-DIAGNOSTIC*	*65535*	*0*

The above report shows the transaction number, reason for termination, date and time of the transaction, pump number and name, number of the used card and volume of the dispensed fuel. In systems with two cards and/or odometer/unit entry, extra columns headed "CARD 2" and "ODOMETER" or "UNIT #" appear between the "CARD 1" and "FUEL(L)" columns. The (L) in the last column indicates this system is set up for litres. In a system set up for gallons, a (G) appears here.

Most of the termination reasons should show "NORMAL", meaning that the driver replaced the hose on the pump. "TIMEOUT" means that the system shut itself off because of a delay in one of the fuelling procedure steps. RESTRT 0 indicates a system problem. The PUMP NAME and CARD 1 number can also indicate irregularities, see Appendix A.

Other possible reasons for termination are:

PMP LMT - The pump fuel limit was exceeded.
TRN LMT - The transaction fuel limit was exceeded.
PULSER - The pump was turned off, but the pulser was still active. (Could be tampering with the pump)
P.I.N. - The cardholder failed to enter the correct P.I.N. and was not allowed to take any fuel.
INVALID - The cardholder was not authorized to take fuel.

L(IST) T(RANSACTION) C(ARD) -- L T C

This command lists all the transactions made by a specific card number or numbers. The system manager uses the L T C command as follows:

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	*L T C <Return>*
Card #'(s):	*6651 <Return>*

L(IST) T(RANSACTION) C(ARD) -- L T C (cont'd)

```
92/10/19 11:20:28                                          PAGE  1
                    -----COMPUTROL-SYSTEMS-LIMITED-----
TRN #   TERM      DATE      TIME   PUMP #-NAME        CARD 1        FUEL(L)
   1    TIMEOUT  92/09/08 01:00    1-DIESEL          6651           0.0
  10    NORMAL   92/09/08  01:02   1-DIESEL          6651          70.1
  35    NORMAL   92/09/10  11:10   8-DIESEL          6651          69.3
```

This report is read in the same way as the L T A report except that it rearranges and separates the printout into specific card numbers. In this instance only one card was requested; however, if more than one card were requested they would be listed in numerical order with each card number on a separate page. Note that the report is still in chronological sequence although the transaction numbers are not consecutive.

L(IST T(RANSACTION) N(UMBER) -- L T N

This command lists a specific range of transaction numbers. For example, if there were some irregularity on a certain day and the system manager knew that transaction numbers 15 to 39 occurred that day, then this report might be useful to pinpoint the time and cause. The system manager uses the L T N command as follows:

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	*L T N <Return>*
Transaction #'(s):	*4-6 <Return>*

```
92/10/19 11:20:28                                          PAGE  1
                    -----COMPUTROL-SYSTEMS-LIMITED-----
TRN #   TERM      DATE      TIME  PUMP #-NAME        CARD 1        FUEL(L)
   1    TIMEOUT  92/09/08  01:00  1-DIESEL          6651           0.0
   4    TIMEOUT  92/09/08  01:00  1-DIESEL          6591           0.0
   5    NORMAL   92/09/08  01:02  1-DIESEL          6651          70.1
   6    NORMAL   92/09/10  11:10  8-DIESEL          6649          69.3
```

This report is interpreted in the same way as the L T A command.

L(IST) T(RANSACTION) P(UMP) -- L T P

This command lists the transactions by pump number and includes the pump fuel total. The System Manager asks for a list of transactions for each pump number or numbers with the L T P command as follows:

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	*L T P <Return>*
Pump(s)	*1-2 <Return>*

92/10/19 11:20:28 *PAGE 1*

-----COMPUTROL-SYSTEMS-LIMITED-----

TRN #	*TERM*	*DATE*	*TIME*	*PUMP #-NAME*	*CARD 1*	*FUEL(L)*
4	*TIMEOUT*	*92/09/08*	*01:00*	*1-DIESEL*	*6591*	*0.0*
5	*NORMAL*	*92/09/08*	*01:02*	*1-DIESEL*	*6651*	*70.1*
6	*NORMAL*	*92/09/10*	*11:10*	*2-DIESEL*	*6649*	*69.3*
					TOTAL	*139.4*

This report is interpreted in the same way as the L T A command except that in this instance the transactions are grouped by pump number. If more than one pump number is requested, the system prints each pump report on a separate page.

The pump fuel total should agree with the total printed when using the P(RINT) P(UMP) command (see Section 3.5).

L(IST) T(RANSACTION) T(OTAL) -- L T T

This command lists the transactions by card number and gives the total amount of fuel per pump taken using that card since the last CLEAR command (see Section 3.8) was given. The system manager may ask for a specific card number or a range of card numbers with the L T T command as follows:

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	*L T T <Return>*
Card #'(s):	*6651 <Return>*

92/10/19 11:20:28 *PAGE 1*

-----COMPUTROL-SYSTEMS-LIMITED-----

TRN #	*TERM*	*DATE*	*TIME*	*PUMP #-NAME*	*CARD 1*	*FUEL(L)*
2	*TIMEOUT*	*92/09/08*	*01:00*	*2-MARKED DIESEL*	*6651*	*0.0*
3	*NORMAL*	*92/09/08*	*01:02*	*2-MARKED DIESEL*	*6651*	*70.1*
6	*NORMAL*	*92/09/10*	*11:10*	*2-MARKED DIESEL*	*6651*	*69.3*
					TOTAL	*139.4*

L(IST) T(RANSACTION) T(OTAL) (cont'd)

This report is the same as that produced by the L T C command except that, in addition, the total of the fuel column per pump is given.

L(IST) T(RANSACTION) V(EHICLE) -- L T V

This command lists the transactions by Vehicle card number and gives the total amount of fuel per pump, taken on using that card since the last CLEAR command was given (see Section 3.8). This applies to a dual card system only. The system manager may ask for a specific card number or a range of card numbers with the L T V command as follows:

EXAMPLE

SYSTEM PROMPT	SYSTEM MANAGER RESPONSE
>	***L T V <Return>***
Card #'(s):	***6651 <Return>***

92/10/19 11:20:28 ***PAGE 1***

-----COMPUTROL-SYSTEMS-LIMITED-----

TRN#	*TERM*	*DATE*	*TIME*	*PUMP#-NAME*	*CARD 1*	*CARD 2*	*FUEL(L)*
12	*NORMAL*	*92/12/12*	*12:39*	*1-L*	*15314*	*9999*	*73.73*
14	*NORMAL*	*92/12/12*	*12:40*	*1-L*	*15314*	*9999*	*2.07*
15	*NORMAL*	*92/12/12*	*12:49*	*1-L*	*23155*	*9999*	*123.66*
16	*NORMAL*	*92/12/12*	*12:50*	*1-L*	*26727*	*9999*	*441.12*
					TOTAL		*640.58*

This report is interpreted in the same way as the L T C report except that in addition, the total of the FUEL column is given for each pump.

5.1 GENERAL

When a user card is held against the PCU card reader surface, a nominal current is inducted through the coils on the card. As the coils are energized, the card's coil connections are sensed and translated by the PCU into a unique number which is compared to those in the PCU's authorization table. If the card number has been authorized, the PCU leads the cardholder through the fuelling procedure by means of prompts which appear on the display. When all entries have been successfully completed, the PCU activates the appropriate pump motor and electronically monitors and records all relevant transaction information. The information can also be logged on the audit terminal and/or the control terminal.

5.2 DRIVER INSTRUCTIONS

The following list provides complete instructions for systems which have all the available options. Therefore, some of these instructions may not apply to your system. All prompts appear on the PCU display, and are listed in proper sequence.

COMMAND	ACTION
"PRESENT CARD"	Hold the card squarely against the card reader recess. If the PCU is configured for dual card operation, present the Operator card first.
"ENTER P.I.N."	Using the keypad, enter your (if applicable) complete four digit security number. Note that all zeros must also be entered. Your number will not appear on the LCD, however an asterisk will signify that each number has been entered and recognized. When four digits have been entered and four asterisks appear, press "OK".
"VEHICLE CARD"	In a dual card system, the first (if applicable) card presented will be an Operator card. Now present the Vehicle card.
"ODOMETER="	Using the keypad, odometer reading (if applicable) numbers selected will appear on the display. If correct, press "OK" to enter the reading. If incorrect, press "CLR" to erase - then enter the correct reading followed by "OK". "UNIT #=" Enter auxiliary number (7 digit (if applicable) maximum). If correct, press "OK" to enter the reading. If incorrect, press "CLR" to erase, then enter the correct reading and "OK".
"SELECT PUMP"	Using the keypad, enter the number of the pump you wish to use; the pump number chosen will appear on the display. If correct, press "OK". If incorrect, press "CLR", then enter the correct pump number and press "OK".
"BEGIN FUELLING"	Turn on pump and fuel vehicle normally.
"ILLEGAL CARD" or "INVALID CARD"	The card presented is not authorized for use. The display reverts to "PRESENT CARD". Driver must consult site supervisor or agent.

5.2 DRIVER INSTRUCTIONS (cont'd)

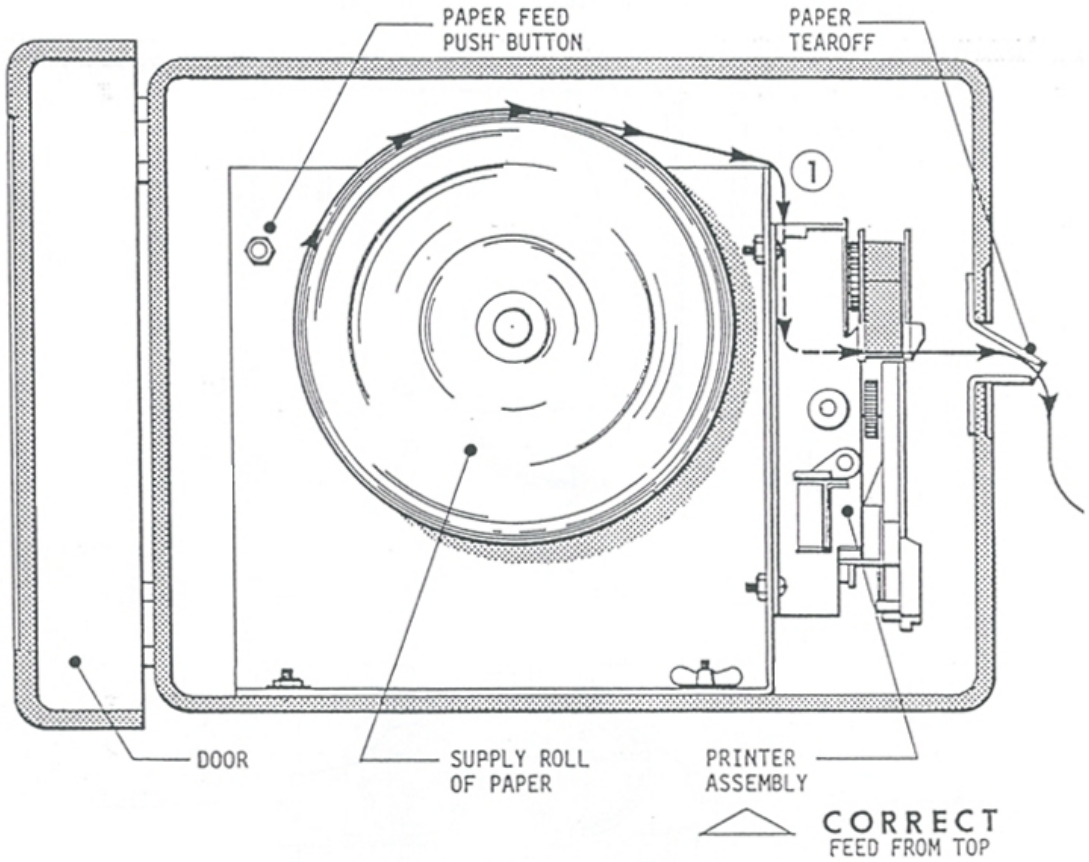
COMMAND	ACTION
"INVALID P.I.N."	An incorrect P.I.N. was entered. Three attempts are allowed to enter the correct P.I.N. before the unit reverts to "PRESENT CARD".
"INVALID PUMP"	The selected pump either does not exist or is not authorized for the card that was presented. The display reverts to "PRESENT CARD". Driver must consult site supervisor.
"RESET PUMP"	The selected pump has not been reset since the last transaction. It must be turned off before starting another transaction. The display reverts to "PRESENT CARD".
"PUMP IN USE"	The selected pump is still in use. The display reverts to "PRESENT CARD".
"PUMP DISABLED"	The selected pump is not enabled for use. The display reverts to "PRESENT CARD".
"ENTRY TIMEOUT"	Too much time elapsed before an answer was entered. The display reverts to "PRESENT CARD".
"CALL DISTRIBUTOR"	The unit's transaction memory is full and fuelling is not possible. Contact the site supervisor.
"PLEASE WAIT"	The unit is undergoing maintenance (System Configuration). If the "PRESENT CARD" message does not appear within ten minutes, contact the site supervisor.
"WAIT-SERVICING"	The system is disabled after the System Manager has issued a "Disable System" command. It is used when transaction data is being uploaded to a host computer or the list of authorized cards is being downloaded into the PCU.

6. 1 CHANGING THE RECEIPT PRINTER PAPER

Refer to Figure 6. 1.When the receipt printer paper supply nears the end of the roll, the receipts have a coloured ink strip.The paper should be replaced at the first sign of the coloured ink to eliminate the possibility of running out of paper. Note: the transactions continue to be recorded in the memory even if the receipt printer is out of paper. In fact, the receipt printer continues to print the records on the empty paper roll. This causes damage to the roll and should be avoided.

To change paper:

1. Unlock and open the receipt printer door.
2. Remove the old roll and throw it away.
3. Place the new roll on the spindle. No retaining mechanism is needed to hold the paper spool, it centres itself on the tapered spindle.
4. Feed the paper over the TOP of the receipt printer to POSITION 1 by hand. The paper roll should move in a clockwise direction.
5. Press the paper feed switch to mechanically advance the paper through the mechanism and out through the paper tear-off guide. The paper need only be at, not through, the guide.
6. Close and lock the door.


PAPER FEED PUSH BUTTON
PAPER TEAROFF
1
DOOR
SUPPLY ROLL OF PAPER
PRINTER ASSEMBLY
CORRECT
FEED FROM TOP

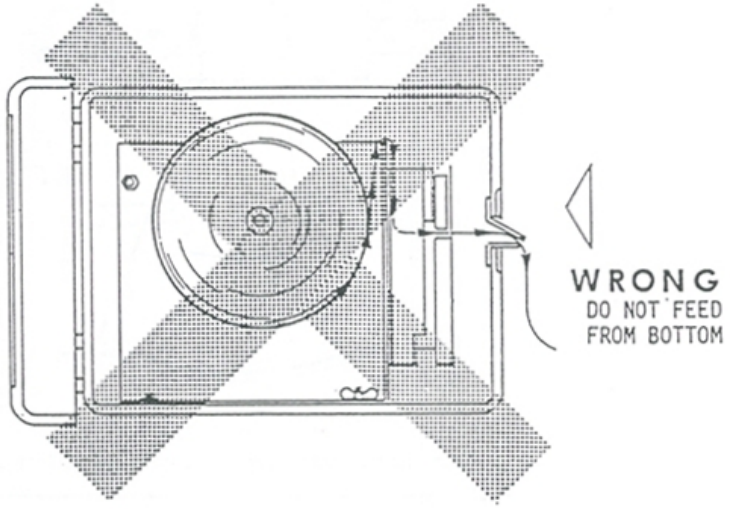

WRONG
DO NOT FEED FROM BOTTOM

Figure 6.1

6. 2 CHANGING THE RECEIPT PRINTER RIBBON

An adjustment wheel (refer to Figures 6. 2 (a) and (b)) controls the striking force of the print head. A new ribbon requires minimal force to produce sharp, clear receipts. As time goes on and the ribbon receives more use, the receipts start to fade. At this point, tighten the adjustment wheel rather than changing the ribbon. The extra striking force darkens the printing on the receipts and extends ribbon life. When you do change the ribbon, remember to re-adjust the wheel for a lighter impact.

The ribbon needs to be changed when the print on the driver's receipt becomes too faint and cannot be improved upon by adjustment of the wheel as explained above. Carefully study the figures to understand the relative positions of the ribbon, paper and mechanical guides. To gain access to the ribbon spools, the receipt printer must be turned to face out of the service door.

To change ribbon:

1. Unlock and open receipt printer door.
2. Remove the wing nut at the bottom front of the printer mechanism.
3. Loosen but do not remove the pivot screw located under the paper roll at the back of the receipt printer mechanism.Ensure that it is loose enough to allow free movement of printer assembly.
4. Swing the receipt printer assembly towards you,exposing the front of the mechanism, the ribbon,and its supply and take-up spools as shown in Fig.6. 2 (b).
5. Snap out the old ribbon spools and ribbon.
6. Snap in new ribbon spools and feed the ribbon through the guides as shown in Figure 6.2(b).
7. If appropriate,set the adjustment wheel to the lightest setting so that the printer head only strikes the new ribbon lightly.
8. Swing the receipt printer assembly back to its original position.
9. Tighten the pivot screw.Replace and tighten the wing nut.
10. Use the paper feed switch to advance the paper through the paper guide.
11. Close and lock the door

.

CHANGING RIBBON IN RECEIPT PRINTER

Figure 62 (A)

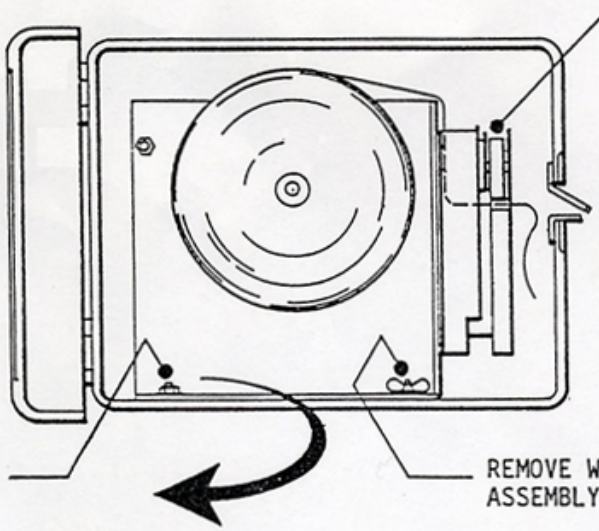
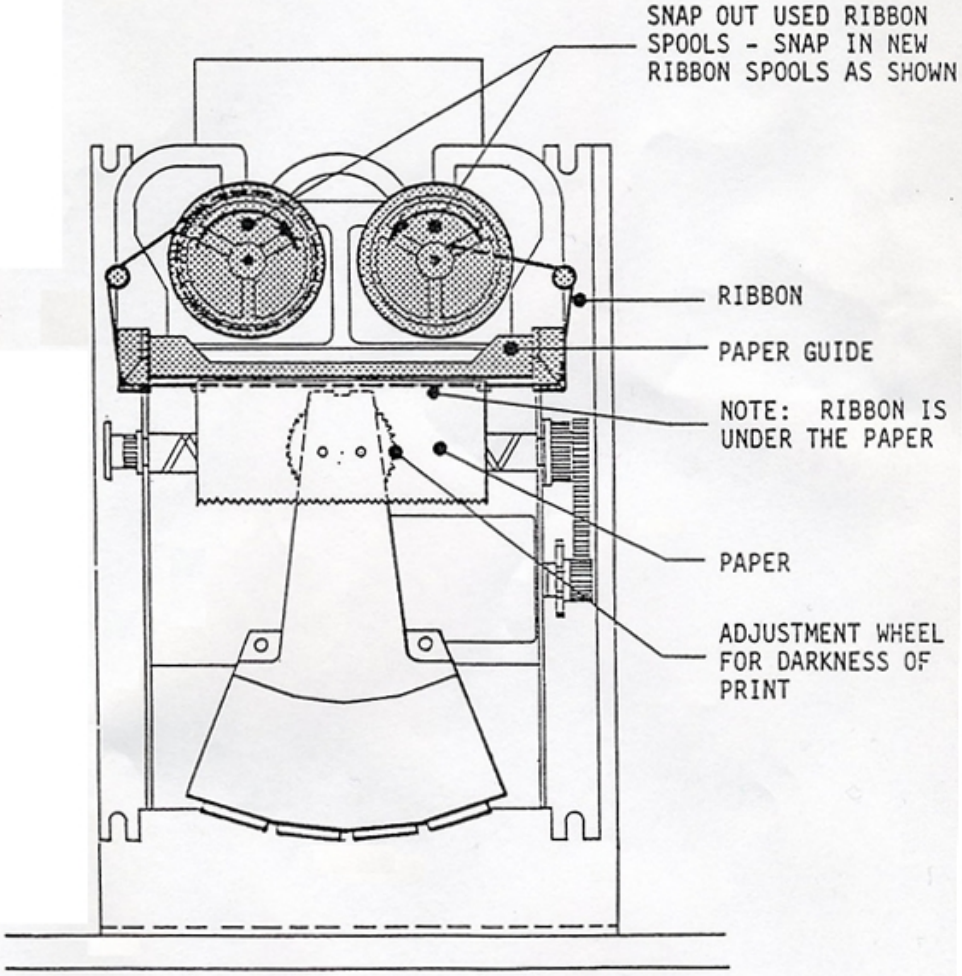


Figure 62 (B)



Figures 62 (a) and (b)

APPENDIX A -- COMPUTER KEYBOARD INFORMATION FOR USERS

1. You cannot accidentally cause an irretrievable data loss or system crash by typing at the control terminal console.

2. > means communication has been established between the PCU and the control terminal. The system is now ready to take your commands.

3. > also means that the system has accepted and executed your input and is ready for the next command. The system always returns to this prompt when it is ready for new input.

4. <RETURN> means Carriage Return, and is accomplished by pressing the "Return" or "New Line" key on your control terminal. The <RETURN> indicates to the system that you have completed a segment of input. In other words, every line of complete input must be ended with a <RETURN>.

5. <RETURN> sometimes may be used to default to or repeat the value already printed. If the system's prompt is already showing what is wanted, then you may press <RETURN> to indicate that the information currently in the system is correct.

6. You can escape from a listing by pressing the ESCape key.

7. The BACKSPACE or DELETE key deletes the last character of input and echoes it on the control terminal.

8. The CONTROL (CTRL) key has no effect on its own; however, when it is held down and another key is pressed simultaneously, special commands are generated. These are demonstrated below, with CTRL representing CONTROL, and KEY representing the alphabetic key used in conjunction with it.

9. CTRL-X or CTRL-U erases the line.

10. CTRL-R repeats the line. This is useful if the printer garbles a line.

11. CTRL-O (toggle) turns ECHO off and on. If the PCU does not send back the characters you type ie; TALK does not appear on screen when you type TALK then Echo is off use CTRL-O to make the system echo.

12. CTRL-S (XOFF) temporarily stops communications until CTRL-Q is pressed.

13. CTRL-Q resumes communications temporarily halted by CTRL-S.

14. CTRL-P (toggle) causes all messages entered on the control terminal to be echoed or printed on the audit terminal.

15. *****TIMEOUT***** indicates that the system has signed off (no longer in the "Talk" mode) automatically. This is probably due to a time lapse greater than 90 seconds since the last input from the control terminal. In order to sign on, the system operator must repeat the TALK-TALK Password sequence. (See Appendix B - Error Summary and Diagnostic Messages).

APPENDIX A -- COMPUTER KEYBOARD INFORMATION FOR USERS (cont'd)

16. Most of the System Management commands (with the exception of TALK, CLEAR, GOODBYE, COLD START, TPW and CPW) may be typed in short form. Only the first letter is necessary to enter commands. For example, SET PUMP and S P accomplish the same task. In the following explanations, the commands are written in full with brackets around the non-essential letters. For example, the System Manager may execute the S(ET) command with either SET or S. The bracketed letters, "ET", are valid but unnecessary.

17. The short forms must have spaces between the function of the command, as in S (for set) and the descriptor (or sub- command) as in P (for pump). For example, the system accepts L A P but not LAP.

18. Commands may also be entered all on one line, with spaces or commas separating segments that are usually ended with a <RETURN>, for example:

E C 1000-1010, 1015, 1020 <RETURN>

instead of:

E C 1000-1010 <RETURN>
E C 1015 <RETURN>
E C 1020 <RETURN>

19. Commands may be entered on two lines:

e.g. S(ET) <RETURN>
P(UMP) <RETURN>

The system prompts the System Manager with the message "Subcommand".

20. When typing clock times, the digits following the colon indicate seconds.→

APPENDIX B

B-1 ERROR SUMMARY

Errors refer to some abnormal condition which results from human interaction with the system. These can be the result of incorrect operator input and are printed by the system on the audit terminal. They may indicate user difficulties or a need for further training.

Aborted

During a LISTing, if the system operator presses the ESCape key, the listing aborts or cancels

Card# XXXXX Already Enabled with Different Parameters

Response to E(NABLE) C(ARD) command if P.I.N., Operator, Vehicle or Both options have already been enabled differently to the current command for that card number.

*****Bad New Password*****

When configuring or SETting the password for "signing on", the verification of the new password does not agree with the first version entered. The system will prompt "Verify New Password" until it receives the correct input, or "CR" is pressed to abort.

*****Bad Character*****

This occurs when the system requires a letter and a number is typed or vice versa, or some other invalid character is entered.

*****Cannot be Disabled When In Use*****

This occurs when the system manager attempts to D(ISABLE) a pump which is currently in use. Wait until the current transaction is completed, then try again.

*****Invalid Card Number*****

This means that the entered card number is not within the preset range of the PCU, or that there has been an error in the input.

*****Invalid Card Number Offset*****

During configuration, an illegal offset has been entered.

*****Invalid Card Series*****

During configuration, an illegal card series has been entered.

B-1 ERROR SUMMARY (cont'd)

********Invalid Command********

This means that the computer does not recognize the command which has been entered. It could be a typing error, or an omission of spaces between the command and the subcommand. Check the command then retype.

********Invalid Date********

This indicates incorrect spelling or format.

********Invalid Fuel Limit********

The entered fuel limit was too big or incorrect characters were typed.

********Invalid Fuel Limit #(s)********

The entered limit number was not within the range of 1-16.

********Invalid Pump Number********

The entered pump number is zero or greater than the number of pumps in the system.

********Invalid Pump Total********

Incorrect characters were entered when setting the pump totals.

********Invalid Password********

The password provided by the system manager was incorrect.

********Invalid Number(s)********

This indicates incorrect format.

********Invalid Reply********

This means that the entered response does not answer the system's question.

********Invalid Time********

Indicates incorrect spelling or format.

********Not Implemented********

Meaning that a command was entered which does not exist in the current version of the PCU software. If using a Fleet 300/600, refer to the abbreviated command set for the Fleet units.

No Transactions

This means that no new transactions have occurred since the unit was last cleared.

B-1 ERROR SUMMARY (cont'd)

********Timeout********

This means that the system manager took longer than 1-1/2 minutes to respond to a system prompt and the system has signed off. The system manager must sign on again using the TALK sequence.

********Transactions Not All Listed********

Means that the system manager has attempted to CLEAR the transaction memory before all the transactions have been listed. A possible cause is that a final transaction has completed between the time of the listing and the CLEAR command. Use the L T N command to request the last transaction(s) still in memory then re-issue the CLEAR command.

********We are not Talking********

This means that the system is signed off and that the system manager must sign on using the TALK sequence.

B-2 DIAGNOSTIC TRANSACTIONS

Diagnostic transactions indicate user problems or system faults as described below. The format of a diagnostic transaction is the same as that of a normal transaction, except that the pump number is 9 (5 in a Fleet unit), and the pump name is *DIAGNOSTIC*. Diagnostics appear in the audit trail or in listings generated by any of the LIST commands (see Section 6). A sample printout follows:

TRN#	*TERM*	*DATE*	*TIME*	*PUMP #-NAME*	*CARD 1*	*FUEL(L)*
1	*PWR FAIL*	*86/12/04*	*12:01*	*3-REGULAR GASOLINE*	*21258*	*324.8*
2	*PWR FAIL*	*86/12/04*	*12:02*	*9-*DIAGNOSTIC*.*	*65535*	*0*
3	*RESTRT 0*	*86/12/04*	*12:03*	*1-DIESEL CLEAR*	*25001*	*12.5*
4	*RESTRT 0*	*86/12/04*	*12:04*	*9-*DIAGNOSTIC**	*65535*	*0*
5	*RAM ERR*	*86/12/04*	*12:05*	*9-*DIAGNOSTIC**	*65535*	*0*
6	*INVALID*	*86/12/04*	*12:06 9*	*9-*DIAGNOSTIC**	*52412*	*0*
7	*P.I.N.*	*86/12/04*	*12:07*	*9-*DIAGNOSTIC**	*22435*	*0*
8	*TIMEOUT*	*86/12/04*	*12:08*	*2-DIESEL MARKED*	*12201*	*123.4*
9	*PMP LMT*	*92/03/22*	*12:32*	*3-REGULAR GASOLINE*	*22988*	*12.3*
10	*TRN LMT*	*92/03/22*	*12:32*	*3-REGULAR GASOLINE*	*22981*	*12.3*

Actual transactions may involve one or two cards and unit number or odometer entries. The simplest form of the system is shown for illustrative purposes. The "TERM" field (for termination reason) indicates the cause of the transaction. Explanations of the various reasons follow.

PWR FAIL - The system experienced a power failure. Any transactions in progress are terminated with the correct card numbers and fuel volumes, followed by a diagnostic transaction with 65535 as the card number. If none are in progress, only the diagnostic appears.

B-2 DIAGNOSTIC TRANSACTIONS (cont'd)

RESTRT 0 - Indicates that the PCU has generated a software reset. Any transactions in progress are terminated with correct card numbers and fuel volumes, followed by a diagnostic transaction.

A four digit code number may appear in the transaction to indicate the cause of the restart. If restarts persist, the code number should be reported to Computrol for diagnosis.

RAM ERR - An error was detected in the RAM memory of the system. If this error persists, there is a possibility that the transaction or authorization memory may be corrupted. The RAM board(s) should be replaced.

INVALID - The card number listed has not been enabled on the system. In a two card system, if CARD 2 appears as zero, CARD 1 is invalid; if CARD 2 is non-zero, CARD 2 is the invalid one. P.I.N. - The user of the card listed as CARD 1 failed to enter the correct P.I.N. number after three tries.

TIMEOUT - The PCU shut the pump off because of an overlong delay between two of the fuelling steps. Generally, the driver did not shut the pump off after fuel was taken.

PMP LMT - The PCU shut the pump off at the pump's fuel limit as established with the S(ET) P(UMP) command.

TRN LMT - The PCU shut the pump off at the card's fuel limit as established with the E(NABLE) C(ARD) and S(ET) L(IMITS) commands.

Repeated occurrences of diagnostic transactions indicate that corrective action should be considered. The first three messages (PWR FAIL, RESTRT 0, and RAM ERR) indicate that the PCU or the site electrical system may require maintenance. The remaining messages indicate that additional user training may be required.

APPENDIX C

C-1 GENERAL

The Fleet 300 and Fleet 600 PCU's feature a single board computer system with memory capacity downsized from that of the C-600. The Fleet 300 and Fleet 600 can accommodate up to 3000 user cards. Transaction memory is directly affected by the number and type of operating restrictions selected during the configuration procedure. Approximate capacities for a four hose Fleet 600, using 500 cards with product and PIN control, are as follows:

System Configuration	Transaction Storage
Single Card	500
Single with Odometer OR Unit #	375
Single with Odometer AND Unit #	300
Dual Card	400
Dual with Odometer OR Unit #	325
Dual with Odometer AND Unit#	275

The smaller memory size of the Fleet model PCU's has necessitated the elimination of certain commands which are standard in the larger C-600 models.

Features not available are:

Fuel Limits per Card
Separate Write-only Audit Channel

Commands not available are:

Help
Set CSP
Set Format
Set Limits
Print Limits
List Authorizations All
List Authorizations Limits
List Transactions Card
List Transactions Pump

Fleet Software versions have much more capability than originally possible; Keypad entry of card number, odometer reading capture and the AN format for enabling cards are all available.

C-2 FLEET COMMAND SUMMARY

S D	***Set Date***
S T	***Set Time***
S H	***Set Header***
S P	***Set Pump***
S TPW	***Set Talk Password***
S CPW	***Set Clear Password***
S MPT	***Set Missing Pulse Timeout***
S NFT	***Set NoFlow Timeout***
P D	***Print Date***
P T	***Print Time***
P H	***Print Header***
P P	***Print Pump***
P S	***Print Status***
P V	***Print Version***
P O	***Print Options***
L C	***List Card range***
L A C	***List Authorized Cards by pump***
L A N	***List Authorized Numbers***
L T A	***List Transactions All***
L T T	***List Transactions with Totals***
L T N	***List Transactions by Number***
L T V	***List Transactions by Vehicle Card***
A N	***Authorize Number (CCCCC\T\P\HHHH\\\\)***
E P	***Enable Pump***
E C	***Enable Card***
E S	***Enable System***
D P	***Disable Pump***
D C	***Disable Card***
D S	***Disable System***
TALK	
CLEAR	
COLD START	