

MID:COM

Datacard

&

Comlink

Guide

MID:COM
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The 8000 System Overview

The 8000 incorporates a computer in the cab that is attached to an electronic register at the meter. The Computer, which measures a mere 12" * 5" * 8", incorporates a 4 line LCD Display with keyboard, a dot matrix printer (capable of printing a 5 part carbon or NCR ticket), an internal 12VDC gel cell battery, a combination CPU/DataCard module and a power distribution module which contains all of the external ports for connecting to the truck battery, the register, the valve and a variety of special I/O functions. The entire computer is encased in a steel enclosure for extra ruggedness. The DataCard is a RAM (Random Access Memory) Device with a sealed connector and its size is approximately the same size as a credit card. The Data cards currently come in two sizes, 1 megabit and 4 megabit. The accompanying register replaces either Neptune or Veeder Root style mechanical registers. The cast aluminum housing measures in at 8.5" * 8.5" * 9". Internally the register couples to the mechanical output of any positive displacement meter and the process of creating & counting digital pulses accomplishes both calibration & product measurement. Accompanying the register and computer are an electronic temperature compensator (optional for LPG and some Oil applications) and an electronic security valve that interfaces with the differential pressure valve mounted on the outlet side of the meter of an LPG meter or a two-stage, preset valve for Oil applications.

The typical principal of operation for the 8000 is to load a DataCard, via a Data Card Reader, in the office with an ASCII data file containing the customer records for that route. In addition to known customer records for the route, the Data Card is loaded with Blank Records (for will calls) and Load Records (to record loads). The DataCard is given to an operator and inserted into the computer on the truck. At the time of a delivery, scrolling or entry of the account number accesses the customer record. The operator confirms the account, inserts a ticket and delivers product. The 8000 automatically resets the register and energizes the security valve. At the end of the delivery, the 8000 print button is pressed twice. The invoice is printed and the transaction record is recorded back onto the DataCard. At the end of the shift, the DataCard is returned to the office for download to the host system. Usually the returned file is stored as a batch file, which the user can view and edit before release for automatic posting.

The following is a brief driver procedure:

A. Day Begin

1. Insert Data Card into computer, turn on truck.
2. Driver presses Shift Total and prints a Shift Total ticket to begin the day.
Retain Shift Total ticket.

B. Delivery (Typical for most software versions)

1. Press Down Arrow from Main Menu
2. Enter the account number by scrolling through the accounts on the Data Card or entering account number.
3. Deliveries can be preset by volume amount (Note: Depends of version of software) or deliveries can be preset by dollar amount.
4. Non-scheduled deliveries are initiated by entering an account number of 8 zeros and then bringing up a Blank Record. The actual account number is then entered as well as price and tax data.
5. Price or tax changes can be entered by the driver prior to delivery but the 8000 shows price and tax from the Data Card.
6. Over riding prices and taxes can also be done after a delivery but not after the invoice is printed. PRINT once gives access to this screen. PRINT twice prints invoice or PRINT once and then press DISC if a discount applies.
7. The driver enters payments after the delivery (ROA), Percent Full, Alert Code (user defined) and Tank Number (usually for LPG accounts).
8. Press START/STOP

C. Loading

1. The driver enters product Loads.
2. Inventory is tracked by use of product codes.
3. A Load Record will be used to store the load information in the Data Card.

D. Day End

1. Driver enters Shift Total and prints a Shift Total ticket to end the day. Removes Data Card and returns to the office. Gives office Shift Total Ticket for Day Begin, Day End, copies of all invoices and the Data Card.

General Rules For Building a Customer Data File

The datacard control Software requires an ASCII data file with records delimited with semi-colons and fields delimited with a carriage-return and a line feed. When the file eventually gets to the Datacard, the customer records are 512 bytes long. The 67 fields that make up the record are short of the 512 bytes, so the software pads out the rest to 512 before sending to the Datacard.

Refer to BCINFO.DAT or the utilities disk for an example of a typical customer file. You will see that the very first character is “;” followed by <CR><LF>. This indicates the beginning of a record and needs to precede each successive record.

Next are 6 fields as described in “MID:COM Datacard Definitions”, each followed by <CR><LF>. Note that the first character of the first field is an “M”. This letter tells the 8000 that this datacard contains customer records, and must be present. The rest of the characters in the first record are ignored and may contain anything. However, each field still needs the right amount of characters and <CR><LF>.

Following the first record is another “;” and the process continues with the first “Real” customer.

After all the customers are loaded, a number of blank records and load records should be added. For regular home and commercial deliveries the number of blank records should be the anticipated number of deliveries to customers that are not on the datacard. For COMLINK Fleet Fueling Deliveries, the number of blank records should meet or exceed the number of vehicles to be fueled in one shift. The number of load records should be more than the anticipated times the truck will refill.

After the last field of the last record and <CR><LF>, a pipe (|) must be appended. This is the end-of-file mark.

The typical errors in getting started with the Datacard are usually caused by a missing “M” record, missing pipe (|), or a missing <CR><LF>’s, one or the other can get stripped off if the file is transmitted to another computer or something similar.

For examples or files refer to the following off the utilities disk.

BCINFO.DAT – Typical customer file for home and commercial deliveries.

BCTRANS.DAT – Output file from “Datacard Control” with deliveries.

CL30.DAT – Typical customer file for Comlink Fleet Fueling.

CLTRANS.DAT – Output file from “Datacard Control” with deliveries.

Description of Sample Files

This diskette (obtained from MID:COM) contains some document files (extension.DOC) and some “dummy” data files (extension.DAT) that may be useful when getting started with the datacard control software. The files on this disk should be copied on the same directory (folder) as the other program and files on the datacard control diskettes.

The data files on this disk are of the “standard” datacard format, not of the extended datacard format.

The dummy customer files are CUST200.DAT and BCINFO.DAT, which are files that contain about 180 “dummy” customer records and some blank records and some load records.

The data files with the word BLANK at the front are the files with about 50, 100, 250, or 1K (1000) blank records. These files are for testing and experimenting with the datacard control programs. Some companies actually use the record files for their day-to-day operations, but these blank record files require the driver to manually enter the correct account number for each customer delivered to. This is not the recommended method of operation for the MID:COM 8000 computer, but it can be a simple method to get started using the datacard in the MID:COM 8000 computer.

The file MASTER11.DAT is a dummy tax code file. Notice the extra characters included in this file to pad the file out to the correct length. These “padding” characters or some other “padding” characters must remain in this file in order for the file to load correctly onto the tax code card. The tax rates, tax labels, and tax code combinations may be changed to create a useable tax code file.

The files CARDDEF.DOC and CARDDEF1.DOC are document files to aid the programmer in the creation of a customer’s data file to be written onto the datacard. They contain the specifications about the number of fields in each customer record, and the specified size each of these fields must be, which make up the data card file.

These programs were run on several computers to test the download time.. On an AMD K6 computer running at 233MHZ, with the program set to run on the COM1 port at 28800 baud, these programs loaded 1023 customer records onto a 4 Mbit datacard in about 4 minutes.

MID:COM 8000 Tax Program Datacard

The tax datacard is used to load tax code information into the MID:COM 8000. It is typically preprogrammed at the factory for the customer's needs and only needs to be used on initial setup or when tax rates may change. This datacard is different from a "standard" datacard only in the fact that it is loaded with the tax information. It may be reused for daily transactions. However the tax information will then be destroyed.

To load the tax datacard into the 8000, simply insert the card with the 8000 turned off. Turn on the 8000 and wait until the unit has completed its self-test and the main menu appears. At this point the taxes have been loaded and the card can be removed. The tax information will remain in the 8000 until this same procedure is repeated.

The two sheets included are the original worksheet used to develop the tax codes and a computer printout verifying the actual information on the card. Note from the worksheet that the tax code numbers select a single tax rate or a combination of rates. For example: Tax code 06 may represent a combination of rates 01,04, and 05. This is programmed into the card as 010405. The code number, not the rate number, is entered into the 8000 keyboard to select the tax. If code 00 is selected, the single manually entered tax rate showing on the display is selected, the display will just show the tax code number and not the individual rates.

CAUTION: Remove the tax card before shutting off the 8000 computer. If the machine powers down while the card is inserted all the tax information will be destroyed.

MID:COM 8000 Computer Register

Tax and Discount Calculations

Taxes:

The standard MID:COM 8000 computer is capable of computing, printing, and writing to the datacard up to 20 different individual taxes. These taxes may be applied in different combinations depending on which apply to a particular customer. The information below explains how the taxes are generated and used by the 8000.

The MID:COM 8000 uses the concept of “Tax Codes” to determine how one or more taxes are applied to a delivery. Each of the possible 20 tax codes (00 – 19) selects one or more of the possible 20 individual tax rates that were preloaded into the 8000 via a “Master” tax datacard. Once these taxes are loaded, they do not have to be reloaded unless the rates change or more need to be added. Taxes can be loaded at the factory or a master tax file can be generated by the host and written into a datacard for on site loading into the 8000. If no tax code information is loaded into the 8000, only tax code 00 has any meaning and any other tax code selection will compute nothing. Tax code 00 is reserved to select the single tax rate that can be manually entered or appears in fields 12 and 13 on the datacard. Note from the datacard field definitions that if field 12 is “C”, then field 13 changes from a tax rate to a tax code, and in that case, tax code information must be loaded into the 8000 for that code to work. The codes are loaded into the 8000 by first generating the tax codes, then loading them into a datacard, and then downloading the card into the 8000. This is done only when initially installed or when the rates or codes change.

Generating Tax Codes

The MID:COM 8000 computes taxes the same way you would on paper or with a calculator. Once the number of gallons is known and the raw product cost computed, the 8000 computes, prints, and writes to the datacard, each tax in the order determined by the tax code. The order of computation is important since the 8000 has the ability to compute a tax on the subtotal of the product cost and one or more other taxes, or in other words, “Tax A Tax”. Whether or not a tax is applied to a subtotal is part of the information loaded into the 8000. The following is a step-by-step approach to generating tax codes. Examples are included for clarification.

1. Determine all tax rates that may apply to any given delivery. The information needed here is:
 - A. Tax method - percent of product cost or dollar per gallon (% or \$)
 - B. Tax Rate – 00.0000 to 99.00000.
 Note 5.7% = 05.7000 5.7 cents/gallon = 00.0570
 - C. How applied – Tax on subtotal or not (Y or N)
 - D. Tax label – Sales tax, excise tax, road tax, more tax, etc.
 Up to 14 characters including spaces may be used and they will print on the ticket.
2. Compile a list of the tax rates using the general format below, numbering from 1 up to 19. The order here is not important.

CAT#	Label	Method/Rate/Applied	Comment
1	Excise Tax	\$00.1250N	12.5 Cents/gallon – not on subtotal
2	More Tax	%05.7000Y	5.7 percent – applied to subtotal
3	Sales Tax	%08.5000N	8.5 percent – not on subtotal
4	Road Tax	\$00.2200N	22 cents/gallon – not on subtotal
5	Tax	\$00.0000N	no tax situation - \$ or % maybe used
.			
.			
19			

Note that only 19 rates, rather than 20 are allowed here. This is because rate 0 is actually the single tax rate from field 13 of the datacard. After a tax is computed and printed on the ticket, it is written to the datacard into the tax category field with the corresponding number. For example, the sales tax amount would be written to field 38, tax category 3.

3. Compile a list of tax codes, numbering from 01 up to 19. (Code 00 reserved) The codes generated here determine which of the above rates are applied to the delivery. The order in which the various rates are applied is important in setting up the code. If a tax is to be applied to a subtotal, it must appear immediately after the tax rate(s) on which it will apply.

Code	Delivery Type	Rates Applied	Comment
01	Resident Heat	1,3	Excise and sales tax
02	Commercial Heat	1,2,3	Excise, more, and sales tax
03	Motor Fuel	3,4	Sales and road tax
04	Farm Diesel	5	No tax
.			
19			

At this point, the necessary information to program a master tax datacard has been compiled and now must be put into one of two formats shown below, to be loaded onto a datacard. The first format is used by “BCMCIN10.EXE” and must be in a file called MASTER11.DAT. The second format is necessary when loading the card through custom software employing the single letter commands that control the datacard interface adapter.

(Refer to the instructions for the interface adapter for more information.) BCMCN10.EXE actually converts the first format to the second, prior to transmission. Note that although the second format is printed 64 columns wide, it is actually a single string of characters, starting with a "T" for tax, and ending with the | (Pipe).

Master11.DAT

The format of Master11.DAT (see sample file) consists of 3 groups of 20 lines each, representing the rates, labels, and code assignments generated above. Exact field length must be observed. Note that the label fields are 15 characters long but the last character (#15) will be truncated, and only the first 14 will print on the ticket. The last character may therefore be anything including a space.

MASTER11.CRD

The format of Master11.CRD (see sample file) is the final product before transmission to the datacard. It consists of 2561 bytes divided into 5 blocks of 512, plus the pipe. Each of the 3 groups from the previous format start on a 512 bytes boundary. Note that only the "T" at the start of the first block has any significance, and the rest of the 511 bytes may be any character. The "T" tells the 8000 that this is a "Tax" datacard.

Below are two examples of how the sample taxes above would compute, print, and be written to the datacard.

Example 1. Using tax code 01 – Datacard field 12 = "C" field 13 = 010000

Gallons Start	0.0		
Gallons Finish	245.0		
Price/Gallon	1.295		
Product Cost	317.28		
Excise Tax	30.63	(245.0X\$00.1250)	field 37 Tax Cat.1 0030.63
Sales Tax	26.97	(317.28X08.5000%)	field 39 Tax Cat.2 0026.97
Total Cost	374.88		

Example 2. Using tax code 02 – Datacard field 12= "C" field 13 = 020000

Gallons Start	0.0		
Gallons Finish	245.0		
Price/Gallon	1.295		
Product Cost	317.28		
Excise Tax	30.63	(245.0X\$00.1250)	Field 37 Tax Cat.1 0030.63
More Tax	19.83	((317.28+30.63) x 05.700%)	Field 38 Tax Cat.2 0019.83
Sales Tax	26.97	(317.23 x 08.5000%)	Field 39 Tax Cat.3 0026.97

Note how “More Tax” was applied to the subtotal of the Product Cost and Excise Tax.

Discounts

Two types of discounts are allowed and both may compute either as a percent of product cost, or dollars per gallon. Discount “A” is a “Quick Pay” discount and is always printed as the last line of the ticket. The rate and whether it is % or \$/gallon, as well as the number of days to pay, can be entered during setup of the 8000 computer. When not using a datacard, this discount will compute and print on the ticket for all deliveries if it was enabled during setup, and thus can selectively apply different discounts to different customers, or apply no discount at all. (See datacard field descriptions). Printed as the last line on the ticket, this discount appears just below “Total Cost” and is not deducted from the total cost.

Discount “B” is computed the same as discount “A”, but it is printed in the ticket just below “Product Cost” and is deducted from product cost before any taxes are applied. This discount’s use is for the “Preferred Customer” since it is the equivalent of charging a lesser price per gallon.

SAMPLE:

GAS DELIVERY IN TOWNLINE COUNTY OF 100 GALLONS AT \$1.00 PER GALLON.

100 GALLONS x \$1.00 = \$100.00

STATE EXCISE OF \$.03 PER GALLON = \$ 3.00

ADD \$100.00 + \$3.00 = \$103.00

SALES TAX OF 5% ON \$103.00 = \$5.15

FEDERAL EXCISE OF \$.07 PER GALLON = \$7.00

INVOICE TOTAL IS:

\$100.00 + \$3.00 + \$5.15 + \$7.00 = \$115.15

MID:COM 8000 DATACARD DEFINITIONS
(SOFTWARE VERSIONS - ALL)

FIELD #	DESCRIPTION	DIGITS	FORMAT	METH.
1	CARD STATUS	4	XXXX	C8
2	LOAD LOCATION	2	XX	M
3	PRODUCT CODE	2	XX	M
4	CUST.NAME	19	Z---Z	CP
5	ADDRESS LINE 1	20	Z---Z	CP
6	ADDRESS LINE 2	20	Z---Z	CP
7	ACCOUNT NUMBER	8	X---X	CP
8	COMMENT LINE 1	20	Z---Z	C
9	COMMENT LINE 2	20	Z---Z	C
10	COMMENT LINE 3	20	Z---Z	C
11	COMMENT LINE 4	20	Z---Z	C
12	PRICE/UNIT	6	XXXXXX	CP
13	TAX METHOD	1	Z	CM
14	TAX RATE	6	XXXXXX	CM
15	DSC. "A" KEY	1	Z	CM
16	DSC. RATE A	6	XXXXXX	CM
17	DSC. "A" DAYS	2	XX	CMP
18	DSC. "B" KEY	1	Z	CM
19	DSC. RATE B	6	XXXXXX	CM
20	PRESET VOLUME	6	XXXXXX	CM
* 21	PRESET PRICE	6	XXXXXX	CM
22	TRUCK NUMBER	4	XXXX	M
23	PLANT NUMBER	4	XXXX	M
24	DRIVER NUMBER	4	XXXX	M
25	TIME START	4	HHMM	8P
26	TIME FINISH	4	HHMM	8
27	DATE	6	MMDDYY	8P
28	ODOMETER START	8	XXXXXXXX	8
29	ODOMETER FINISH	8	XXXXXXXX	8
30	PRICE/UNIT USED	6	XXXXXX	8P
31	TAX METHOD USED	1	Z	8
32	TAX RATE USED	6	XXXXXX	8
* 33	GROSS GALLONS	8	XXXXXX.X	8
34	NET GALLONS	8	XXXXXX.X	8P
35	PRODUCT COST	9	XXXXXX.XX	8P
36	SEQUENCE #	6	XXXXXX	8P
37	TAX CAT. 1	7	XXXX.XX	8P
38	TAX CAT. 2	7	XXXX.XX	8P
39	TAX CAT. 3	7	XXXX.XX	8P
40	TAX CAT. 4	7	XXXX.XX	8P
41	TAX CAT. 5	7	XXXX.XX	8P
42	TAX CAT. 6	7	XXXX.XX	8P
43	TAX CAT. 7	7	XXXX.XX	8P
44	TAX CAT. 8	7	XXXX.XX	8P
45	TAX CAT. 9	7	XXXX.XX	8P
46	TAX CAT. 10	7	XXXX.XX	8P
47	TAX CAT. 11	7	XXXX.XX	8P
48	TAX CAT. 12	7	XXXX.XX	8P
49	TAX CAT. 13	7	XXXX.XX	8P

50	TAX CAT. 14	7	XXXX.XX	8P
51	TAX CAT. 15	7	XXXX.XX	8P
52	TAX CAT. 16	7	XXXX.XX	8P
53	TAX CAT. 17	7	XXXX.XX	8P
54	TAX CAT. 18	7	XXXX.XX	8P
55	TAX CAT. 19	7	XXXX.XX	8P
56	TAX CAT. 20	7	XXXX.XX	8P
57	DISCOUNT A AMT.	7	XXXX.XX	8P
58	DISCOUNT B AMT.	7	XXXX.XX	8P
59	TOTAL COST	9	XXXXXX.XX	8P
60	METER NUMBER	1	X	CM
61	RECV'D ON ACCT.	8	XXXXXXXX	M
* 62	TICKET NUMBER	6	XXXXXX	CM
63	PERCENT FULL	4	XXXX	M
* 64	TANK NUMBER	10	X...X	M
65	ALERT CODE	2	XX	M
66	QUANTITY LOADED	6	XXXXXX	M
67	CARD SERIAL #	6	XXXXXX	8

FORMAT KEY:

* - INDICATES NOT IMPLEMENTED IN VERSION 1.0
X - ASCII CHARACTER (NUMERIC)
Z - ASCII CHARACTER (ALPHANUMERIC)
HHMM - HOUR AND MINUTES
MMDDYY - MONTH DATE AND YEAR

METHOD KEY:

C - WRITTEN ONTO CARD BY HOST COMPUTER
M - MANUALLY ENTERED INTO 8000 BY OPERATOR
8 - WRITTEN ONTO CARD BY 8000
P - PRINTED ON DELIVERY TICKET

MID:COM 8000 Datacard field descriptions (Version 604H and most similar versions)

Records in the datacard file for the MID:COM 8000 consist of 67 fixed-field-length fields. All the fields must be present and they must be of the exact field length described below. Fields which are not completely filled to the field length requirement must be "padded out" to the correct length. This is critical for the MID:COM 8000 to read the datacard.

Field 1: Card Status: 4 digits format X000 (version 1.0)

Card status is written to the datacard by the host computer and may be over written by the 8000 computers. It is the only field that is affected by both systems. In version 1.0, the number in this field defines one of three transaction types and determines if and how the transaction was acted upon. The three transaction types defined in version 1.0 are:

Status 1000 - regular delivery record -	status 0000 when completed
Status 4000 - blank delivery record -	status 0000 when completed
Status 3000 - load record -	status 2000 when completed

Status is used by the 8000 for sorting and locating transaction records. The host system may use it for similar purposes. Note that since the 8000 computer doesn't record from scratch, an adequate number of blank records and load records must be written to the card by the host computer, along with the regular customer delivery records.

In version 1.0 only the first two bytes of the status field are significant. The first determines the type of record as described above and the second determines whether the record is locked out from driver access if it has been used for a delivery. The lockout feature reduces the time to scan or search for the record by "hiding" the used records. Use of the second byte only applies to status types 1000 and 4000, and the byte can only be a 1 or a 0. If the host computer writes a 0 to byte 2, then the record will be locked out from further access after the delivery is completed. If a 1 is written, the record may be accessed again and overwritten.

Example:

1000 > delivery made > 0000 -- further access denied
1100 > delivery made > 0100 -- record may be accessed again

Field 2: Load Location 2 Digits Format XX

Load location is manually entered by the driver during a load operation and is used to identify from where the product was loaded.

Examples:

- 00 - main plant
- 01 - acme terminal
- 03 - satellite plant 5

Field 3: Product Code 2 Digits Format XX

The product code is manually entered by the driver during a load operation and is used to identify the type of product being loaded.

Examples:

- 00 - regular gasoline
- 01 - #2 fuel oil
- 02 - propane - home heating
- 03 - propane - motor fuel
- 04 - diesel - taxable

Field 4: Customer Name: 19 digits format XXXXXXXXXXXXXXXXXXXXXXX

Field 5: Address Line 1: 20 digits format XXXXXXXXXXXXXXXXXXXXXXX

Field 6: Address Line 2: 20 digits format XXXXXXXXXXXXXXXXXXXXXXX

These fields are written to the datacard by the host computer and are displayed along with the account number as the driver scans through the datacard. They will print on the ticket unless they are filled with all spaces.

Field 7: Account Number: 8 digits format XXXXXXXX

The account number is written to the datacard by the host computer and is used to identify the customer and locate delivery information on the datacard. A special case exists for an account number which contains all zeros (00000000). This case is reserved for blank delivery records. Blank records are used for deliveries to customers whose account number and other information that had not been previously written onto the datacard.

Fields 8-11: Comment Lines: 20 digits format XXXXXXXXXXXXXXXXXXXXXXXX

These fields are written to the datacard by the host computer and are general purpose in nature. These four fields will be displayed to the driver following the customer name, address, and account number screen. However if field 7 is all zeros, then all four fields are not displayed. They are not printed on the ticket or acted on in any other way. They may be used for driver instructions, additional customer information, or any other purpose.

Field 12: Price/Unit: 6 digits format XXXXXX [XX.XXXX] (\$)

Price per unit is written to the datacard by the host computer. The driver may change the price before or after the delivery, but not during.

Field 13: Tax Method: 1 digit format X (\$,%c)

Field 14: Tax Rate: 6 digits format XXXXXX [XX.XXXX] [XX0000]

These fields are used together to determine the tax rate or code number. Tax method defines whether the tax will be in terms of dollars per gallon, percent of product cost, or a tax code representing multiple taxes. If tax method is "c" then the tax rate format changes to XX0000, where XX is the tax code number. I.E. 050000. These fields are written to the datacard by the host computer.

Field 15: Discount "A" Key : 1 digit format X (\$ or % or "d" or "p")

Field 16: Discount Rate "A": 6 digits format XXXXXX [XX.XXX]

Field 17: Discount "A" Days: 2 digits format XX

These fields are used together to determine a "quick pay" discount. Like taxes, discounts may be computed as dollars per gallon or percent of product cost. Field 15 defines which of these methods apply to the rate in field 16. If field 15 is "d" (dollars) or "p" (percent), the discount will be computed and printed for the sale, however if field 15 is \$ or %, the discount is still defined but not computed or printed. The result of the discount "A" computation is printed on the delivery ticket as, "XX DAY DSC. XXXX.XX", and is always the last line on the delivery ticket. The discount amount is not deducted from the total cost. These fields are written to the datacard by the host computer.

Field 18: Discount "B" Key : 1 digit format X (\$ or % or "d" or "p")

Field 19: Discount Rate "B": 6 digits format XXXXXX [XX.XXXX]

These fields are used together to determine the discount applied to the sale before any taxes are applied. Application of the "B" discount is the same as for the "A" discount, except it is deducted from the previously computed product cost, and printed in the line following product cost.

Field 20: Preset Volume: 6 digits format XXXXXX

Preset volume is the number of gallons that the customer requested or is allowed. If preset auto stop valves are used in the system, these valves will be shut to stop product flow when the amount delivered reaches the preset volume. This field is written to the datacard by the host computer.

Field 21: Preset Price: 6 digits format XXXXXX [XXXX.XX]

Preset price is the total cost of the delivery at which the preset valves will shut down product flow. For example, if the customer ordered \$100.00 of product, the 8000 computer calculates the number of gallons necessary to come up with \$100.00 worth of product, including all applicable taxes and discounts, and then uses this gallon amount to shut the valves at the appropriate time. This field is written to the datacard by the host computer. This function is not implemented in version 1.0 or higher.

Field 22: Truck Number: 4 digits format XXXX

Field 23: Plant Number: 4 digits format XXXX

Both truck and plant numbers are programmed into the 8000 computer during initial setup. Plant number normally refers to location where the truck is based. Both fields are written to the datacard by the 8000.

Field 24: Driver Number: 4 digits format XXXX

The driver number is programmed into the 8000 computers and may be changed at any time by the driver. This field is written to the datacard by the 8000 computer.

Field 25: Time Start: 4 digits format XXXX [hh:mm]

Field 26: Time Finish: 4 digits format XXXX [hh:mm]

Time start is the time when the delivery ticket was inserted into the 8000 computer and both the computer and register head are reset to zero. Time finish is the time when the delivery ticket is printed to complete the transaction. Both fields are written to the datacard by the 8000 computer. These times are in military format, i.e. 6:00 pm = 18:00 note the separator mark (:) is not written to the datacard.

Field 27: Date: 6 digits format XXXXXX [mm/dd/yy]

The date is written to the datacard by the 8000 computers when the delivery ticket is printed. Note that the separator marks (/) are suppressed.

Field 28: Odometer Start: 8 digits format XXXXXXXX

Field 29: Odometer Finish: 8 digits format XXXXXXXX

Odometer start is the odometer reading recorded at the time the ticket is inserted and the 8000 computer resets to 0. Odometer finish is the reading at the time the delivery ticket was printed. If these readings are not the same for any particular delivery, the truck had been driven before the ticket was printed. Both fields are written to the datacard by the 8000 computer.

Field 30: Price Per Unit Used: 6 digits format XXXXXX [XX.XXXX]

Price per unit used is the actual price used for the transaction since the driver is able to override a price that was written to the datacard by the host computer. This field is written to the datacard by the 8000 computer.

Field 31: Tax Method Used: 1 digit format X (\$,%c)

Field 32: Tax Rate Used: 6 digits format XXXXXX [XX.XXXX] [XX0000]

These fields represent the actual tax values used since the driver is able to override the tax written to the datacard by the host computer. See fields 12 and 13 for definitions. These fields are written to the datacard by the 8000 computer.

Field 33: Gross Gallons 8 digits format XXXXXX.X

Gross gallons is the amount delivered before correcting it for expansion or contraction with temperature. If the 8000 computer was not set up for temperature compensation, then gross gallons is the same as net gallons. It is not implemented in software version 1.0.

Field 34: Net Gallons 8 digits format XXXXXX.X

Net gallons are the amount of product delivered as it was displayed and printed by the 8000 computers. If the 8000 was not set up for temperature compensating the amount registered, then net gallons is the same as gross gallons. This field is written to the datacard by the 8000 computer.

Field 35: Product Cost 9 digits format XXXXXX.XX

Product cost is the result of calculating net gallons X price/unit, when the delivery has ended and the ticket is printed out. It is written to the datacard by the 8000 computer.

Field 36: Sequence Number 6 digits format XXXXXX

The sequence number is initialized during setup of the 8000 computer. Once set, it increments by one for each delivery. It is both printed on the ticket and written to the datacard by the 8000 computers.

Fields 37 - 56: Tax Categories 7 digits format XXXX.XX (\$)

Tax category amounts, along with their associated labels are printed on the ticket. Tax categories represent the results of the computations of the 20 available tax rates that may be applied to the 20 possible tax codes. If the driver had chosen tax code 00 at the time of delivery, the values in fields 30 and 31 are used and the result is written to field XX. If the driver selected a tax code other than 00, then the tax category rates that make up the particular tax code used, are computed individually, printed on the ticket, and written to the datacard in the corresponding field. Refer to "taxes and discounts" for more detailed information on how the taxes are applied.

Field 57: Discount "A" Amount 7 digits format XXXX.XX (\$)

Field 58: Discount "B" Amount 7 digits format XXXX.XX (\$)

The two discounts are the results of the computation of the values in fields 15 thru 19. They are written to the datacard by the 8000 computer.

Field 59: Total Cost 9 digits format XXXXXX.XX

Total cost is printed on the ticket and written to the datacard by the 8000 computer. Total cost is the sum of the product cost, shown in field 34. And all taxes, shown in fields 36 thru 55, less discount b shown in field 57.

Field 60: Meter Number 1 digit format X

Meter number is selected by the driver depending on which meter is used for the delivery (dual system). This field is written to the datacard by the 8000 computer.

Field 61: Received On Account 8 digits format XXXXXXXX [XXXXXX.XX]

Received on account may be entered by the driver following the printing of the delivery ticket and prior to the next delivery. Note that the decimal point is suppressed. This field is written to the datacard by the 8000 computer.

Field 62: Ticket Number 6 digits format XXXXXX

Ticket number may be written to the datacard by the host computer in a situation where delivery tickets are preprinted, and an additional cross reference to the transaction is necessary. This field is not displayed or acted upon by the 8000 computer.

Field 63: Percent Full 4 digits format XXXX

Percent full may be manually entered by the driver following the printing of the delivery ticket and prior to the next delivery. Its intended purpose is to allow the host system a means to correct its degree-day system. The field is general purpose and not limited to percent values. The actual gallons in the tank, or even a pre-designated code may be entered. This field is written to the datacard by the 8000 computer.

Field 64: Tank Number 10 digits format XXXXXXXXXXXX

Tank number may be entered by the driver and may be used in a situation where one customer has more than one tank. This field is written to the datacard by the 8000.

Field 65: Alert Code 2 digits format XX

The alert code is manually entered by the driver after a delivery ticket has been printed, or during a load operation. The alert code is a general-purpose field for use by the host computer. Its purpose is to allow the driver a means to alert the host computer of an abnormal situation during a delivery or load operation, but is not limited to this use. This field is written to the datacard by the 8000 computer.

Examples:

- 01 - tank not full
- 02 - customer not home
- 03 - fill pipe clogged
- 04 - equipment problems

Field 66: Quantity Loaded 6 digits format XXXXXX

Quantity loaded is manually entered by the driver during a load operation and represents the amount dispensed into the truck. This field is written to the datacard by the 8000 computer.

Associated fields are:

- 2 load location
- 3 product code

Field 67: Card Serial Number: 6 digits format XXXXXX

This field is written to the datacard by the host computer. It is not used in this version.

Set-Up and Communication with the MID:COM Card Reader Under SCO UNIX

By Donna Gavin (edited by Mike Walls)

Editor's Preface: Donna Gavin is a Systems Analyst for a large propane operation that currently uses MID:COM 8000's. We asked Donna to write a perspective on setting up the MID:COM 8000 DataCard Reader with a UNIX operating system. MID:COM does offer a standard Windows Interface but UNIX is not so simple – or standardized - that you can write a “generic” interface. If you are going to write a UNIX interface, this document is meant to assist you. Please do not copy Donna's routines verbatim and expect it to work for you without your own programming changes. Even if you are running SCO UNIX on an IBM 36, like Donna's company is, there is no way we can guarantee the outcome. But, this document should help reduce your efforts greatly, especially if you put this into a flowchart format.

There is no standard UNIX driver available for the MID:COM Datacard reader. Since time was not available to write and test a driver, the following approach was used instead for setup and communication with the MID:COM card reader. I was initially worried about possible timing problems, but it has been used successfully at each of our **6 plants** preparing data cards for **35 trucks** daily without difficulties.

Limitations: Since the communications are performed by writing directly to the device file, the user that is reading or writing a DataCard must be logged in as a user with root permissions. At our installations, this is not a problem, since the reader is located at the main console that is always logged in by user root.

Set-Up:

- 1) Identify a serial port that is available on your port board and determine the name for that terminal. For example: port 15 may map to **tty10**
- 2) Check the file `/etc/gettydefs` for an entry that fits the requirements for the card reader.

To inspect **gettydefs**, type: `more /etc/gettydefs`

[Press Enter]

The **m** entry:

```
m # B9600 HUPCL # B9600 C88 SANE HUPCL TAB3 ECHOE -IXANY #\r\n@login: # m
```

seems to fit for our system.

3) Update the entry in `/etc/inittab` to indicate the correct **gettydef** for the port.
To update the entry, type: **vi/etc/inittab** **[Press Enter]**

If **tty10** is being configured and **gettydef m** was selected in step 2, the entry would read:

D10: 23:off:/etc/getty tty10 m

4) Check the terminal type for the port identified in step 1. The type should be unknown.
To update the entry, type: **vi/etc/ttytype** **[Press Enter]**

If **tty10** is being configured, the entry should read: **unknown tty10**

5) Disable logins on the selected port.
If **tty10** is being configured, type: **disable tty10** **[Press Enter]**

Set-Up and Communication with the MID:COM Card Reader Under SCO UNIX

Communications:

Preparing the text file:

The data for the MID:COM card must be sent as a single record with no line feeds to separate the records. However, when importing data into our software package, the system expects each data record to be terminated by a line feed character. The last few (about 20) bytes of each MID:COM data record are not used and must be filled when creating each ticket. To solve the import problem, I used the tilde (~) as the **last character** in each record, since it would not normally occur in the regular data stream. When reading the DataCard, the tilde is translated into a line feed character allowing the records to be imported.

Writing a DataCard:

The data file prepared by appending to a text file to form one record. A pipe character (|) is appended following the last data record.

A short script is used to write the text file to the DataCard.

For example, the following scrip **file mcwrite.sh**

(**with permissions r w x r - - r - -**) will write the text file mcwrite.txt to the card reader attached to **ttylo**.

```
Echo 'W\c' > /dev/ttylo  
Cat mcwrite.txt > /dev/ttylo
```

First **echo** sends the **write command** to the card reader. The **/c** assures that a line feed will not be sent after the **W** character. Then **cat** is used to send the text file to the reader.

Set-Up and Communication with the MID:COM Card Reader Under SCO UNIX

Communications: (continued)

Reading a DataCard:

Two scripts are used when reading the DataCard.

First, a block read is invoked and the data is sent to a text file.

In our example, the following script file **mcread.sh** (with permissions **r w x r - - r - -**) will read the information from the card reader attached to `ttyi1o`.

```
echo 'B\c' > /dev/ttyi1o
cat < /dev/ttyi1o > mcread.txt
```

First **echo** sends the block to the card reader. The `\c` assures that a line feed will not be sent after the **B** character. Then **cat** is used to send the information from the card reader to a text file **mcread.txt**.

Since the system has no way to determine when the data transfer is complete, the user must check the yellow transfer light on the card reader and press the system interrupt key (it may be the Del key on the keypad or Ctrl-C) when the light goes out and the transfer is complete.

(Due to timing considerations, part of the first record on the data card may be lost, but since this is the M identifier record which contains no delivery information so no actual ticket information is lost.)

Second, the text file is processed through another script to translate the tilde (~) characters to line feeds prior to file import.

In our example, the following script file **mcread2.sh** (with permissions **r w x r - - r - -**) will translate the data in **mcread.txt** into **mcfile.txt**.

```
tr "~" "\012" < mcread.txt > mcfile.txt
```

The file **mcfile.txt** is now in a form that can easily be imported into most databases.

Expanded Datacard Capacity Field Description And Record Layout For MID:COM 8000 – 900 Series Versions

Introduction

In response to requests from our customers with very large customer populations, we are introducing a new software version for the MID:COM 8000. It is backward compatible with the cyberbox, uses the standard datacard and requires no hardware changes to the cyberbox or to the MID:COM 8000. The changes from the previously released versions are in the simplification of the file structure on the datacard. We have worked with most of the software houses in the fueling industry, and they reassure us that they can quickly adapt to the new datacard format. Since this is a minor extension of the existing datacard format you will want to refer to the original documentation. That documentation is contained in CARDDEF.DOC and CARDDEF1.DOC, and is available on request.

General

This new version has simplified the data on the datacard to have only two record types:

Delivery Records – Which contain the results of all deliveries and fuel loading.

Customer Records – Which contain customer data that eventually has appended to it the delivery information and is written into the delivery record after each sale.

By comparison to our previous versions, the customer record is the first 21 fields except for the second one that contained the load location. That field is still written into a delivery record after a load is performed. In the overall picture the delivery records are still identical, with 512 bytes, and customer records are now 128 bytes long.

Card record Layout

The datacard must contain the following, in the order specified.

Note: This applies to the 4 MEG datacard.

1. 1 start delivery record. (“M” Record)
2. 98 blank delivery records.
3. 1 stop delivery record.

4. 1 blank customer record.
5. 3 to 3691 customer records.
6. Pipe symbol.

1. The start delivery record is the standard 67 field format. This first status byte must be the letter “M”. This identifies the datacard as one that contains customer information. This “M” record serves as the template for all other delivery records. The record must be constructed with all 67 fields plus 24 bytes of padding to fill the 512 bytes record size. All delivered records will end up being an image of the “M” record with the delivery information overlaid into the appropriate fields. Refer to the 8000 card operation below for more explanation.

2. Blank delivery records are also in the 6 field format. The first status byte must be a “1” to denote “undelivered”. When used it will be changed to a “0”. Any characters may be used to fill the other 511 bytes. Up to 98 deliveries may be made before the 8000 will show a message to remove the card. The datacard will then have to be written or restored.

3. The stop delivery record is also in the 67 field format except it’s first status byte is a “9”. The 8000 will search for a blank delivery record until it finds this record. At this point, all 98 blank deliveries have been used.

4. The blank customer record has a status of “4”, and the account number field must be all zeroes. This record is used for unscheduled deliveries where the customer record doesn’t exist on the card. The driver may override the zero account number once the record is found. This record and all customer records use the abbreviated 128 byte format. All 20 fields must be written, along with 14 characters of padding.

5. Customer records have a status of “1”. The status does not change, so any customer record as well as the blank, may be used over and over, up to the limit of the 98 delivery records. Any number of customer records may be written to the card, up to a total of 3692 including the blank.

Important: Customer records must be written in multiples of 4 records each, so that the pipe occurs on a 512 byte boundary. The minimum number of customer records is therefore 3 plus a blank. The maximum number is 3691 plus a blank.

6. The pipe symbol must be written to the card immediately after the last byte of the last record. It actually is the first status byte of the next record, but reading or writing ceases when it is encountered.

Note: There is no longer a need to load “load” records. A load will be written to a blank delivery record and will change it’s status to “2”.

MID:COM 8000 Card Operation

When a driver locates a customer on the datacard, the following takes place:

1. The next undelivered record (status 1) is located and the address stored.
2. The "M" record is read off the card and stored in a buffer in the 8000.
3. The information from the customer record is overlaid into the buffer.
4. The 8000 polls the buffer for the customer information.
5. The delivery is made and the computations are overlaid into the buffer.
6. The buffer is written back to the card at the previously stored address.

Datacard Loading Format MID:COM 8000 Series 900 Versions

Loading Directly to the Interface Adapter

When controlling the interface adapter directly with the single letter commands, the file to be loaded to the card consists of one continuous ASCII string that starts with the letter "M" and ends with a Pipe. All fields and all records are contained together, and there are no field or record delimiters. The "M" ends up being the first character on the card, and the Pipe the first character after the last byte of the 128 byte customer record. Records are either 512 or 128 bytes, so padding of any character must be appended to the end of the 67th or 16th field respectively.

Loading Through MID:COM Software

The MID:COM program NCINIT.EXE will take a file called NCINFO.DAT, reformat it to the specification above, and write it to the datacard without any software control of the serial port. The program is set for 28.8 K BAUD and COM 1. Contact the factory for different combinations of BAUD rate and COM port.

The file NCINFO.DAT contains records in a delimited format. Each record begins with a semicolon (;), then a carriage-return and line feed. Each field in the record also ends with a carriage-return and line feed. No padding is required after the 16th or 67th field. The Pipe should occur right after the line feed of the last field on the card.

Note: An example of NCINFO.DAT is on the MID:COM Demo Disk.

Customer Record Layout

MID:COM 8000 – 900 Series Versions

Field #	Description	Bytes	Format	Comments
1	Card Status	4	XXXX	
2	Product Code	2	XX	
3	Customer Name	19	Z....Z	
4	Address Line 1	20	Z....Z	
5	Address Line 2	20	Z....Z	
6	Account Number	8	XXXXXXXX	
7	Price/Unit (\$)	6	XXXXXX	Implied Decimal XX.XXXX
8	Tax Method	1	Z	
9	Tax Rate	6	XXXXXX	Implied Decimal XX.XXXX
10	Disc. "A" Key	1	Z	
11	Disc. Rate "A"	6	XXXXXX	Implied Decimal XX.XXXX
12	Disc. "A" Days	2	XX	
13	Disc. "B" Key	1	Z	
14	Disc. Rate "B"	6	XXXXXX	Implied Decimal XX.XXXX
15	Preset Volume	6	XXXXXX	Implied Decimal XX.XXXX
16	Preset Price	6	XXXXXX	Implied Decimal XX.XXXX

114 Bytes

Z = Alpha numeric characters

X = Numeric character

MID:COM Model 801 Datacard Interface Adapter Specifications and Operation Instructions

Electrical Specifications:

Power: 9 VDC. @ 100 MA. (Wall plug-in power supply)
RS-232 Female DB-25 Connector
Pin usage: Pin 2 – Received data fro PC
Pin 3 – Transmitted data to PC
Pin 7 – Signal ground

Indicators: Power - Red light
Transmit - Yellow light
Receive - Green light

Communication Specifications:

Character Type: ASCII
Baud Rate: 300-28800, Switch selectable internally
(Settings on bottom of unit)

Data Bits: 8
Stop Bits: 1
Parity: None

Operation:

Once power is applied and a datacard is inserted firmly into the receptacle, the interface adapter is ready to accept one of nine single letter commands. Only the letter, without a carriage return, needs to be sent. The adapter will echo back all command characters the first time it is sent. For example, the “R” command reads one record at a time. The first time the “R” is sent it will be echoed back along with the 512 byte record. Each subsequent “R” sent will not be echoed, and only the record will be sent.

Commands (Capital Letter Only)

P – Present
T – Test
W – Write
A – Append
B – Read Block
R – Read Record
C – Read Changed Record
S – Reset Record Status
F – read Card Size

“P”

“P” checks to see if the interface adapter is connected and on-line. When the “P” is sent, the adapter simply echoes a “P” back to the host and waits for the next command. The “P” command is generally used for initial setup and troubleshooting, and to see if the adapter is ready. Since other devices like modems can echo characters, it’s important to monitor the transmit/receive LED’s to determine if the echo came from the adapter.

“T”

“T” tests the integrity of the datacard. After the “T” is sent, the interface adapter sends the message “Beginning datacard test” to the host, and begins writing a special pattern of characters to the datacard. This process takes a little over one minute for a 1 Megabit datacard, and a little over 2 minutes for a 4Megabit datacard. When the writing is completed, the adapter sends the message “pattern written to datacard”, and if no errors were found the message “end of the datacard test” is sent. If errors are found the message “a bad location was found at: XXXX” is sent, where XXXX represents the location address.

“W”

“W” puts the interface adapter in the “write mode”. Each character sent following the “W” is written to the datacard. Any number of characters may be transmitted up to the capacity of the particular datacard being used. The last character sent must be the “|” (Pipe) to denote the end of file. When the “|” is encountered, the adapter returns to the command mode. Each character written to the card is echoed back to the host, except for adapter versions that end with “weo” (write echo off).

An escape character sent any time before the Pipe will also exit the write mode and return to the command mode. Note that the escape aborts the present command and the data that was written does not constitute a valid file without the Pipe.

“A”

“A” puts the interface adapter in the “append mode”. The append mode operates in exactly the same manner as the write mode, except the written data is appended to the end of the file already in the card. The new data overwrites the Pipe at the end of the file, so the Pipe must be transmitted as the last character of the appended records.

“B”

“B” puts the interface adapter in the “block read” mode. In this mode, all data on the card is transmitted to the host starting with the first character and ending with the Pipe. The adapter checks for a Xoff after sending each character, and if encountered, will halt transmission. Transmission resumes when the host sends a Xon. If and “ESC” is sent instead of a Xon, the block read will be aborted and the adapter will return to the command mode.

“R”

“R” puts the interface adapter in the “read record” mode. In this mode, one record of 512 bytes is sent using the same Xon /Xoff protocol described above, starting with the first record on the card. After the record is sent, the adapter returns to the command mode but is expecting to see either another “R” to read the next record, or an “ESC” to abort the read record mode. If an “ESC” is received instead of an “R”, the internal record counter is reset to zero and the adapter is ready for any command. As in the block read, the escape may also be sent after a Xoff has halted transmission from the adapter. When the adapter finds the Pipe character at the end of the field, it sends it to the host and also returns to the command mode.

“C”

“C” puts the interface adapter in the “changed record read” mode. This mode works the same as read record except that the adapter searches for, and transmits only records that have a status of 0XXX or 2XXX. (See datacard field definitions). Records of this type have been “used”, or contain information in addition to what was originally written to the datacard. This type of read is faster than the record read described above when large customer files are being used and only a portion of the records are used.

“S”

“S” resets the records’ status described above to their original values, allowing a quick way to restore the “used” customer records to a “not delivered” status. Only the status is changed and not the customer information or data from the last delivery. If the customer information such as price or tax rate must be changed, all the records on the card must be written with the “W” command. In the case of a “blank record” which initially has a status of 4000, and an account number of 00000000, the status will be

restored to 4000 if the account number was not changed prior to the delivery. If a valid account number was entered to overwrite the 00000000, then the status will be restored to 1000, indicating this is no longer a blank record, but rather a useable customer record. A used load record, with a status of 2000, will be restored to a useable load record with status 3000.

“F”

“F” determines the capacity of the datacard and sends a four byte message representing the size of the datacard. The datacards are also marked on the back with the designation – DS61-XXX, where XXX indicates the size. The following table shows the relationship, if the account number is non-zero. If the account # is all zeros. It will be restored to a 4000 status.

Card Size (KBITS)	Record Capacity	Card Marked	Size Readout
1024	256	-001	0200
4096	1024	-004	0800

Operational Note:

The datacard interface adapter is a microprocessor-based device running under the control of the host computer system. If the host aborts an operation unexpectedly, the adapter may get caught in a loop and cease to accept commands. If the adapter does not respond to input, turn it off and then on again to reset it. Then check operation with the “P” command.

Datacard Control Software

Instructions for Setting up and Running the MID:COM Datacard Control Version 1.0 Software for control of the Datacard Interface Adapter in the Windows 95 operating system.

After the programs have been installed, left double click the MIDCOM Datacard Control icon, to run the program. A small box should appear. The title is MID:COM Datacard Control. There are two items at the top of the box, "File" and "Help." "Help" is currently not available. You will need to set up several items under "File".

Left click on "File". Four options should be available:

1. Com Port Settings
2. Default Locations
3. Record Layout
4. Exit

1. Left click on Com Port Settings. Three items with options should now be available for changes.

1 A. The first is "Port options". There are two possibilities, Com 1 and Com 2. Left click on the COM port number that the datacard interface adapter is connected to. If you do not know which COM port your datacard interface adapter is connected to, you may have to use the trial and error method.

1 B. The "Baud Rate" is another item that you will need to select an option. The available baud rates for this program are 28800, 19200, or 9600 baud. You will need to left click on one baud rate number. The number you select must be the same as the baud rate that the datacard interface adapter is set to. The datacard interface adapter has eight small slide switches inside. The cover must be removed to access these small switches. The adapter is capable of communication at 300, 600, 1200, 2400, 4800, 9600, 19200, or 28800 baud. Slide the switch to the "on" position that matches the speed you have selected in this program. There is a chart of switch settings and baud rates on the bottom of the adapter. The adapters are shipped from the factory with the default setting of 9600 baud. You may wish to start at this slower speed to verify operation, and then switch to the highest speed, 28800 baud, once you are certain everything is working properly.

1 C. "Connection Preferences". For these programs to function properly with the Mid:Com Datacard Adapter, these options MUST be set as follows:

Data Bits	8
Parity	None
Stop Bits	1

When you are finished making these selections, left click Okay. Do not click Defaults, as this will erase any settings you have just made.

1 D. "Write Delay". On some faster computers, Windows will send two characters out to the datacard interface adapter in rapid succession, without the proper time delay. When this happens, one character at a time gets "lost" and does not get written to the datacard. The result is that even though the datacard program does not see nor report any errors, the datacard cannot be read by the MID:COM 8000. If you are using a fast computer, you may wish to click in the "Extra Write Delays" box and type in a number. A good starting point for a 200 Mhz computer is 20. For a 400 Mhz computer, you may want to start at 100 and for a 600 Mhz computer, maybe start at 200. This number sets a short delay time between characters and was meant to be fine tuned to the particular P.C. the program is running on. If the MID:COM 8000 computer still has trouble reading the datacard, first try increasing this number by 20 each time, and if you continue to have problems, call the MID:COM factory.

When you are finished making these selection, left click Okay. Do not click Defaults, as this will erase any settings you have just made.

2. Left click "File" again. Then left click "Select Default Locations". There are six items to set up here:

2 A. "Input Path" This is the directory/path in which the file to be written to the datacard is located. Eg. C:\DATACARD

2 B. "Output Path" This is the directory/path where the file created, when the datacard is read, is written to. Eg. C:\DATACARD

2 C. "Master Tax Path" This is the directory/path where the master tax file for creating tax code cards is located. Eg. C:\DATACARD

2 D. "Input File" This is the name of the file that contains the data to be written to the datacard. Eg. BCINFO.DAT

2 E. "Output File" This is the name of the file created when a datacard is read. Eg. BCTRANS.DAT

2 F. "Master Tax File" This is the name of the file that contains the tax code card data to be written to the tax code card. Eg. MASTER11.DAT

Click on any field that may need to be changed. Back space and or delete over the default file names or paths, and type in the correct ones. You may need to contact your software supplier to determine the correct information to be entered here. Left click on OK when you are finished entering the information.

3. Left click "File" again. Left click on "Record Layout". This part is to tell the program the layout of the records you will be using. At the present time, Mid:Com has two different "layouts", the standard datacard format and the expanded datacard format. The standard datacard format is discussed first.

To set up for the standard datacard format, enter the following numbers into the boxes:

Delivery Record Size	512
Delivery Record Count	250 if using 1 megabit datacards. 1000 if using 4 megabit datacards.
Customer Record Size	128
Customer Record Count	0

This may seem confusing, but these are the proper settings to make the program work in the standard datacard format. The standard datacard format uses only 512 byte size records, therefore the field labeled "Customer Record Count" MUST be set to 0. Only the expanded datacard format requires a non-zero number in the "Customer Record Count" field.

For expanded datacard format, enter the following numbers into the boxes:

Delivery Record Size	512
Delivery Record Count	100
Customer Record Size	128
Customer Record Count	620 if using 1 megabit datacards. 3692 if using 4 megabit datacards.

Make sure the box for Semi-colon delimited is checked. Left click the OK box. The program will tell you the size of the datacard required with the current settings. Left click OK.

4. Left click "File" again. Notice the line, which says: "Expanded Tax Format". If you are using a version of the software in your MID:COM 8000 which requires the expanded tax format, then make sure there is a check mark to the left of the words "Expanded Tax Format". If you are not using a software version, which requires the expanded tax format, make sure there is NOT a check mark to the left of those words. If you are not sure, leave it unchecked and call the MID:COM factory with your MID:COM 8000 version number.

Left click on "file" to remove this setup menu from the screen.

This completes the "setup". Most of these settings will not need to be changed, depending upon your programs or system.

You should now be back to the "main menu" box. Inside this box is a smaller box, titled "Select an Option". There are six options available:

"Find the Size of the Datacard". This option will check the size of the datacard inserted in the adapter, and will display the size on the screen. This is an excellent option to test the connection and the operation of the adapter. It will verify that the datacard interface adapter is turned on, that it is plugged into the specified COM port, that the same baud rate is set in the adapter as in the program, that there is a card inserted, and that everything is communicating properly.

We recommend you chose this option first, every time you run this program. If everything is working correctly, a message will appear which says, "A x Mb datacard is inserted", with x being 1 or 4, depending upon the card. Left click OK.

"Initialize the Datacard" This option will write the data in the file, in the "Input Path", with the name specified in the "Input File" described earlier. The file must be a flat ASCII file. It MUST have the correct number of characters in each field, as described in the CARDDEF.DOC and CARDDEF1.DOC documents.

* Important note: The data file may no longer have remark or "comment" lines, preceded by an asterisk, or between customer records, as was previously allowed with the DOS only version of the program which writes data to the datacard. (This is not to be confused with the COMMENT LINE 1 through COMMENT LINE 4 fields.) Also, NO checking is done to verify that each field has the proper number of characters! It is important that your program, which creates the customer data file, puts the correct number of characters or padding into each field, and that it creates the proper number of fields.

"Read the Datacard". This option reads the datacard and puts the data into a file specified by "Output Path" and "Output File" specified earlier. The data is written to the

file in the same format that the DOS only version wrote it, that is, 8 lines of 64 characters each, followed by a carriage return and line feed. Each customer record is 512 characters and is written to the file in this format. The only difference is that this new program does NOT write a pipe (|) character at the end of the file!

"Get Delivered Transactions" This option will create an output file that contains only customer records for customers to whom deliveries have been made. The file has the same format as a file created by the "Read the Datacard" option. (That is, 8 lines of 64 characters each.) This method of transferring the delivery data from the card to a file in the office computer is quicker than the "Reading the Datacard" method. The file has the same path and filename as with the "Read the Datacard" option, but will contain only "delivered to" customer data. There is no "dummy" "M" record in the file with this option. Also, no pipe (|) character is written at the end of the file.

"Status Restoration of Datacard Files". This option resets the first status byte of the customer record, changing it from Delivered to Non-Delivered status. This option must only be used only after the datacard has been read with either the "Read the Datacard" or "Get Delivered Transactions" options. Note that status restoration does not affect any data stored in the customer record except the first status byte. The next delivery made to the customer will over-write the previous data, however, if certain fields are not used in the present delivery, the old data will still remain. Tax amounts and discounts are typical examples. To avoid a potential problem, it would be best to use the "Initialize the Datacard" option.

"Master Tax Card Initialization" This option writes the master tax code file, specified in "Master Tax Path" and "Master Tax File", to any datacard for downloading tax codes to the Mid:Com 8000. There are currently two formats of tax rates, tax labels, and tax code combinations. They are 20 x 20 x 100 (Standard) and 100 x 100 x 100 (Expanded). A standard tax code file specifies up to 19 different tax rates (plus the first one which is reserved for the single percent or cents per gallon tax entered from the keyboard), up to 19 different tax labels (plus the first label), and up to 99 (plus the first label) different combinations of these tax rates and labels. Each customer could then have a specific tax combination of several different taxes, rather than just a single percent tax or cents per gallon tax. Some customers will never use this option.

Note: Version 1.0 of the Datacard Control Program for tax card initialization differs from the previous DOS only version in that it does not pre-format the source tax file by "padding out" the 512 byte blocks of data. It simply writes the file to the card as a sequential stream of characters. Refer to the file: MASTER11.DAT. The tax code file must have the padding characters added to it.

In Version 2.2, this requirement for the padding has been eliminated. The tax code file is simply a listing of the tax rates, the tax labels, and the tax code combinations, without any additional padding required. See the example file: MASTER14.DAT. Also see the document: TAXCALC.DOC.

Note that there is no option available to "display the records". This was an option available on the DOS only program. The file created by reading a datacard or get delivered transactions can be viewed using any word processor, but the data will be in the format of 8 lines of 64 characters each. The fields will all be strung together and there will be no field names, which may make it difficult to decipher the data.

Note: the pipe character is a vertical line with a gap in the middle. On the keyboard, it is normally the upper character on the back-slash key. It may not print on the printer used to print this document.

It prints like this (|) on this printer.

**MID:COM 8000 Computer Register
Ticket Specifications
Model MCR-80 Dot Matrix Printer**

- General Type:** Snap set or continuous form, with or without envelope.
- Copies:** Maximum of 5 copies or a total thickness of .017.
- Paper Type:** Top copy – carbonless self contained remaining copies - carbonless or carbon interleave.
- Width:** 4.0 to 5.0 inches. Printer side stops are field adjustable and factory set at 4.25 inches.
- Length:** Minimum 4.5inches. Any length is permissible.
- Line Spacing:** 4 – 7 lines per inch. Line spacing is field adjustable and set to 6 inches at the factory, using a 3 part carbonless form. Adjustment may be necessary depending on the thickness and construction of the form.
- Print Type:** 8 pin Dot matrix impact using reverse double strike.
- Line Length:** 25 characters maximum, occupying 3 inches in width.
- # Of Lines:** 16 to 20 maximum depending on line spacing. Printer is adjustable for insertion depth. The first line of print will occur 3.5 inches from the insertion edge of the ticket with the depth set to maximum. The number of lines may vary from one delivery to another depending on how the 8000 is used and number to taxes calculated.
- Construction:** Ticket must be glued on the insertion edge. On continuous form tickets the sprocket stub may be removed but does not have to be if the maximum number of lines will not be printed. It is preferable to also glue the opposite end of the ticket, or at least provide solid crimp to keep the copies together.
- Cautions:** It is very important to have no discontinuities in form thickness in the print area. All parts of the form need to be bound at the insertion edge. If the ticket uses an envelope, the edge of the envelope or a tape strip for the envelope cannot be present in the print area. Perforations on any parts of the form are also prohibited in the print area. Failure to observe these cautions may cause ticket tearing and printer problems, and void warranties.

MID:COM 8000/Comlink Datacard File Format For Fleet Fuel Deliveries

General:

A MID:COM 8000 running a Comlink version of software typically uses the standard 8000 file format with a few variations. In a standard 8000 application, the Datacard is typically loaded with many customer records and a small number of blank records for unscheduled deliveries. In a Comlink application the individual vehicle deliveries are written to blank records, and therefore it's necessary to load as many blanks as there will be vehicles to be filled in a particular shift. The blank records need only to have a "4" in the first status byte, and all the rest of the field can be zeroes.

Customer Record Format:

The only difference in the customer record is in the status bytes.

- STAUS BYTE 1: Initialize to "1". It will be set to "0" when the transaction is complete and the record written back to the card.
- STATUS BYTE 2: Initialize to "0". This prevents the record from being selected again after it has been once used.
- STATUS BYTE 3: Initialize to "F". This will cause the Fleet Delivery Y/N selection to default to "Y".
- STATUS BYTE 4: Initialize to "0". This will be changed to "X" when the transaction is complete. It indicates this record contains the final delivery information for a series of Fleet transactions.

Delivery Record Format: (Used Blank Record)

The delivery record format uses a small subset of the customer record. Referring to the format listing, the unused fields will be returned with zeroes.

Field

1. Card Status.

Byte 1: This BYTE is changed to "0" to indicate a delivery has been made.
Byte 2: This BYTE remains at "0".

Byte 3: This BYTE will be either a “0” or “F” depending on what it was in the customer record.

Byte 4: This BYTE is changed to an “F” indicating this record is a Fleet Delivery record.

4 – 7. Name, Address, Account Number.

These fields are passed down from the customer record.

8. Button I.D. Number.

9 –10. Vehicle I.D. Number.

This is the optional number programmed into the button and may be up to 40 digits long, occupying all of both Fields 9 and 10. The number is left justified and will fill Field 9 and then start filling Field 10 from the left when digit count exceeds 20. The data will end with a “!” for an end-of-file mark. If non-programmable or not-programmed buttons are being used, Field 9 will contain “0!”.

27. Date.

Current date of delivery.

33. Fleet Volume.

This is the amount delivered to the vehicle. It is right justified in the Field and has an implied decimal at 7.1.

Example: XXXXXXXX.X

36. Sequence Number.

The sequence number is incremented each time a fleet Delivery is made and also when the final record is written back to the customer record. Therefore, the customer record will have a sequence number that is one greater than the last Fleet record of the delivery.

55. Fleet Start Time.

The time the button is read. The format is HHMMSS with the last digit is the Field not being used.

56. Fleet Stop Time.

The time when the Fleet delivery is over and waiting for the next button read.

60. Meter Number.

The currently selected meter number on the 8000.

MID:COM 8000/Comlink Installation And Operation

Receiver installation:

1. Mount the receiver antenna at the highest point on the vehicle, preferably the top of the tank. Orient the antenna so the horizontal beams are generally perpendicular with the delivery hose during use.

Route the antenna cable into the cab of the truck without going through window or doorframes, or anything that could kink or crush the cable. Carefully route the cable to the vicinity of the receiver.

2. Using the Velcro strip provided, mount the receiver in a convenient location. (Typically the top of the 8000 computer).

- Refer to “Comlink receiver connections” for the following steps:

3. Connect one end of the 9 pin serial cable to the receiver and the other end to the inboard 9-pin connector on the back of the 8000 computer. Secure the connectors with the thumbscrews on the cable ends.

4. Connect the antenna cable to the receiver and tidy up all the cabling with cable ties.

5. The receiver has a connector on the rear, which provides 12 volts, ground, and a normal open relay contact. The relay closes momentarily to signal the operator of the Comlink Status. Refer to “Description of Operator Signals”.

Button Installation:

The buttons are provided with a durable double-stick adhesive pad and can be mounted anywhere on a clean dry surface. Screw-down plastic holders are also available at an additional cost.

The most important consideration in mounting the button is location. Preferably the button should be near the fill point. In some instances however, this may prove to be impractical. Since the Comlink System uses radio to transmit the button I.D. number to the receiver, all the rules of radio apply. The best location for the button is where it has a relatively good line-of-sight view to the truck. The signal will pass through or reflect off many objects, and is not guaranteed to transmit through a large vehicle.

Button Reader Wand Battery Replacement:

A single 6-volt lithium battery powers the Comlink Wand. The battery should provide for approximately 2000 button reads, assuming the wand is energized for 2 seconds or less per read.

The battery is a type that is commonly used in photo applications and can be purchased wherever photo batteries are available. Typical numbers are Duracell PX28L and Energizer L544. The “L” in both numbers indicates that the battery is lithium powered.

Alkaline batteries are available in the same numbers without the “L” and absolutely should not be used. Poor performance and damage to the wand are possible.

To replace the battery unscrew the end cap from the bottom of the wand being careful not to lose the spring as you open it. Move the disk out of the way and shake the battery out of the wand.

Install a new battery with the “+” end facing out. Place the disk over the battery and replace the end cap and spring.

Test the wand before use. If the battery is installed backwards there will be no damage to the wand, however it will not work. If the wand doesn't work, check the battery installation and make sure “+” end is facing out.

Reading a Button:

To read a button, simply touch then end of the wand to the button and press the switch on the wand. The alignment of the wand with respect to the button is not critical. Once the center and outer of the wand make connection with the center and outer contact of the button, the button can be read. To conserve battery life, only hold the wand switch on for as long as it takes to get a signal from the fuel truck. Refer to “Description of Operator Signals” for details.

Receiver From Panel Indicator:

POWER - Indicates the receiver is powered either by the MID:COM 8000 or by the rear panel power jack.

RD - (Receive Data) Lights when the Comlink receiver is receiving commands from the MID:COM 8000 over the serial port.

TD - (Transmit Data) Lights when the Comlink receiver is sending data to the MID:COM 8000 over the serial port.

DATA - Lights when a valid button I.D. has been received. It will stay lit until the MID:COM 8000 interrogates the receiver or after a few seconds of delay.

SIGNAL - Indicates the R.F. portion of the circuit is receiving something. It should always flicker with no wand transmission. When the wand button is depressed, and not reading a button, the signal indicator should light continuously.

MID:COM 8000 Operation With Comlink Interface:

For the general operation of the 8000 systems refer to the operating instructions included with the unit. The following operation steps include the Comlink features.

1. Insert datacard.
2. Arrow-down. Choose search or scan.
3. Select customer.
4. Arrow-down. Change settings if necessary.
5. Arrow-down. The following screen will appear:

FLEET DELIVERY
< (Y)
< DELAY SECONDS 00

If the customer records' status byte indicated this was to be fleet delivery, the (Y) would appear automatically. The driver can press the LINE 2 button to toggle it from "Y" to "N" and back.

The delay seconds can (and must) be set to some number 01 to 99. This is the number of seconds from the touch of the button to when flow must start. It is also the time from when flow stops until the control valve closes and the delivery record is written to the card. Once set, the time will default to the same until changed.

6. Arrow-down. Insert ticket. The register will reset and the following screen will appear:

WAITING FOR
COMLINK
TRANSMISSION
PRESS PRINT TO END

7. Insert the nozzle into the tank **but do not open it.**
8. Touch the wand to the button pushing a little sideways to make sure the outer ring on the wand contacts the side of the button. It's not necessary to push hard or have the wand flat against the button. In fact the wand can be as much as 30 degrees off center and still read a button reliably.
9. Activate the wand and listen for a beep. **Deactivate the wand immediately when the beep is heard.** Then listen for a second beep.
10. After the second beep, the valves will open. Open the nozzle and begin the delivery. If the second beep was not heard go back to Step 5.
11. Stop fueling and the 8000 will timeout and record the delivery.
12. Repeat from Step 3 until all vehicles are filled.
13. Print out the ticket.

Emergency Shutdown

While in pump mode activate the wand.

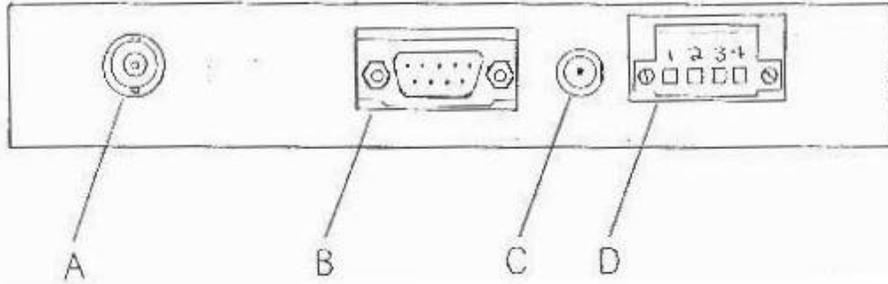
The Comlink will respond with 1 short and 1 long beep indicating the valves are closed.

Comlink receiver Connections

There are four connectors on the rear of the Comlink Receiver. See the diagram. The connectors are as follows:

- A. The connectors marked "A" is the connection for the coaxial cable for the external antenna. Align the two numbers on the connectors with the grooves in the mating connector. Push the connector on the jack and turn approximately one-quarter turn clockwise, looking from the rear of the receiver.
- B. The connector marked "B" is the connection for the RS-232 serial communications cable. A serial cable must be connected here and the other end must be connected to the inboard 9 pin serial connector on the back of the MID:COM 8000 computer. Tighten the thumbscrews on the connectors on both ends of this cable.
- C. The connector marked "C" is for an external power source, if the receiver is not being used with a MID:COM 8000 computer. This connector will have nothing plugged into it if the receiver is being used with a MID:COM 8000 computer.
- D. The connector marked "D" is for the wires to make the horn honk, a beeper beep, light a lamp, etc. when a button has been read correctly. There are four places to insert wires and small screws on the top to tighten them in place. Two small screws facing the rear can be loosened to unplug this connector and make it easier to attach the wires. This connector has four pins. Looking from the rear, starting on the left, we will call this pin 1. Pin 1 provides a constant +12 volts. Pin 2 is ground. Pin 3 and 4 are the normally open switch contacts of the internal relay. The 12 volt pin is capable of supplying .5 amp. The relay contacts can switch up to 10 amps. If more than .5 amp is required for the signaling device, an external 12 volt source should be used.

ComLink Receiver (Rear View)



MID:COM 8000/Comlink Description of Operator Signals

General:

The Comlink receiver is required with a relay output to activate an external signal to alert the operator as to what the truck equipment is doing in response to activating the Comlink wand. A four position terminal block on the back of the receiver provides 12 volts, ground, and normally open relay contacts. The relay can be connected to the truck horn, backup alarm, buzzers, beepers, lights or any other type of signal. 12 volt power from the receiver may be used to directly power a device requiring .5 amp or less. If more power is required, the relay contacts are capable of 10 amps and can be used to control an external 12 volt source.

As an option to the Comlink System, MID:COM provides a “Sonolert” device that produces a loud (95 db) tone. For efficient and reliable operation of the system, the operator must have feedback from the 8000/Comlink. If deliveries are to be made in quiet residential areas at night, the use of audible signals may not be appropriate and flashing lights may be a better choice.

The following is a description of the signals, under different conditions, of what the operator would hear or see when he activates the wand. First is a summary, followed by a detailed explanation. We will refer to the signal as a “Beep”.

Note: The key to the signaling system is deactivating the Wand as soon as a beep is heard. Keeping the Wand activated will cause false signal responses.

Summary

1 Short Beep:

No button touched (emergency shutdown) or 8000 did not acknowledge button.

2 Short Beeps:

Button touched – 8000 acknowledged – valves open for delivery.

3 Short Beeps:

Selected meter on 8000 and meter number in button don't match. Valves remain closed.

1 Short, 1 Long

Emergency shutdown (during pump mode) – valves close.

Detailed description:

1 Short Beep:

The Comlink receiver will respond with 1 beep any time a valid button number is received. If the Wand is activated and no button is touched, the Wand generates a button number of all zeroes which indicates an emergency shutdown to the system. When not in pump mode, and the 8000 is waiting for a transmission, the no-touch emergency shutdown has no effect other than the 8000 will display the message "Comlink Transmission – No Button Touched". If the operator was touching a button but the 8000 did not acknowledge, a transmission error to the 8000 occurred and a message will be displayed on the 8000 and printed to the roll printer if used. This is a very rare error and the operator needs only to touch the button again. The receiver will always respond with a beep regardless of the state of the 8000.

2 Short Beeps:

The first beep indicates that the receiver got a valid read as described above. The second beep indicates that the 8000 interrogated the receiver and acknowledged a valid button read. The valves will open, the shutdown timer will start, and pumping can begin. When the timeout ends after pumping, the delivery will be recorded to the Datacard and roll printer if used.

3 Short Beeps:

This indicates that the meter number selected on the 8000 does not match the meter number in the button and the valves will not open. This actually constitutes a delivery, and a zero volume record will be written to the datacard and printed to the roll printer. The last line on the printer will read "Meter Number Mismatch".

Matching meter numbers with the 8000 and the button is a safety feature to reduce inadvertently filling a vehicle with the wrong product. The first character of the vehicle I.D. (VIN) number programmed into the button is the meter number. We now support 0, 1 and 2. If the number is "0" then a match is not necessary and the valves will open for either meter number selected on the 8000. If it is 1 or 2, it must match the meter selected for the valves to open.

If using non-programmable buttons (DS1990A) or programmable buttons (DS1992A) but not programming a vehicle number, the wand will insert a "0" in the appropriate field to allow any meter selection to open the valves.

1 Short – 1 Long Beep:

This indicates the operator initiated an emergency shutdown by activating the wand during pump mode. This only has an effect while in pump mode when the valves are open. It does not however require product to be flowing. Timeout will still occur normally and the delivery will be recorded to the datacard and the roll printer if used. The last line in the printout will say "Emergency Shutdown".

MID:COM 8000/Comlink Do's and Don'ts for Reliable Operation

The following is a list of Do's and Don'ts compiled from actual field use of the Comlink System.

- ? **Do** test the programmable buttons before installation on the vehicle. If the meter number is wrong or in the wrong place, or if the end-of-file character is missing the button won't work.
- ? **Do** replace the wand battery before it's totally dead. Factory testing show the battery is good for 2000 reads at two seconds per read. In actual use the button should take less than one second to read, but operator use of the wand will determine the real battery life.
- ? **Do** replace the battery with a lithium type. Alkaline batteries will not do the job.
- ? **Do** maintain the wand probe tip. If it looks dirty, clean it off with a mild solvent like alcohol. Buff it up with a "Scotchbrite" pad or something similar.
- ? **Do** use the hole in the wand end cap to attach some sort of lanyard. The Wand is extremely rugged, but repeated drops on the probe tip may deform it and degrade performance.
- ? **Do** touch the button firmly but **Don't** over do it. Momentary contact must be made from the side of the probe tip to the side of the button and from the center of the probe to the top of the button. It's not necessary to be squarely on the button. In fact a slight angle and push to the side works well.
- ? **Do** put the nozzle into the tank before reading a button, but **Don't** open it.
- ? **Do** activate the wand only after the probe touches the button.
- ? **Do** deactivate the wand as soon as you hear a beep.
- ? **Do** select a timeout period that will give the operator time to get the delivery started, but keep it as short as possible to prevent fueling the next vehicle on the previous button read.
- ? **Do** mount the receiver antenna as high as possible with as good a "view" of the surrounding area as possible.
- ? **Don't** activate the wand for no reason. It just wastes batteries.

? **Don't** open the nozzle until after you hear the second beep indicating the valves are opening. Pressure differentials can cause a small amount of flow, maybe a tenth or two, which will get recorded on the total but not n that particular delivery.

? **Don't** install buttons with double-sided adhesive on vehicles that will be washed with solvents or harsh chemicals. The buttons may be washed away too. Use the plastic flange mountings. The buttons will not be harmed by the chemicals.

? **Don't** use the 8000/Comlink System without solenoid valve control. Without valves there is absolutely no control of where the product is dispensed.

? **Don't** use the system without a signal connected to the relay output of the receiver. Without feedback, the operator has no way of knowing the status of the truck equipment.

Dallas Semiconductor iButtons®

Supported iButtons:

Comlink supports the Dallas DS1990A and DS1992 buttons. Both buttons contain a unique 12 digit serial number. The DS1990A has only the serial number and no additional memory, so it is not write-able. The DS1992 contains battery backed RAM and can be written and rewritten any number of times.

Writing iButtons:

Buttons are written to through a PC's serial port. A button receptor and COM port adapter are required for electrical hookup. Dallas provides Windows 95/98 based software to do the actual writing of the buttons. The buttons, hardware, and software are available directly from Dallas Semiconductor. You can also contact their customer service department at (972) 371-4969. The part numbers are:

DS1402D-DR8	Dual blue-dot receptor to RJ11 coiled cord.
DS9097E	COM port adapter, EPROM upgraded.
TMEX Software	Download directly from the website.

As an alternative to going directly to Dallas, MID:COM offers a Kit that includes the two part numbers above, a 9X25 serial Cable for an easier hookup, and the necessary software on a floppy Disk. The MID:COM part is:

708-0046	Button Programmer Kit
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Data Format:

The buttons will accept up to 125 bytes of information, which can be anything that can be entered from a PC keyboard. However, MID:COM limits the number of digits programmed to 43 (38 printable plus \$\$\$, a meter ID digit and a ! symbol), and only the following characters are allowed:

(space) !"#%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN OPQRSTU
VWXYZ (UPPER CASE ONLY)

The Format For The Data Is:

(\$\$\$)(METER#)(0 thru 38 DIGITS)(!)

Example: \$\$\$0 VEHICLE NUMBER 123456!

The three-dollar signs are required and are used by the Comlink Wand to detect if something was written to the Button and where the data starts. They are stripped off and not printed as part of the character string.

The meter number digit is required and must be the same for the valves to open and dispense product. If 0, either meter may dispense. If using non-programmable buttons, or programmable buttons with nothing programmed, the Wand will append 0 for meter number.

Up to 38 digits may be entered for the vehicle I.D. They may include any from the list above.

The !, must be entered as the last character. This indicates the end of the file to be transmitted. If missing, the button cannot be read. As with meter number above, the ! will be appended to non-programmable or not-programmed buttons.

Note: When entering data, watch the digit counter in the entry window, and
Do Not Exceed 43.

Hardware and Software Setup and Operation:

1. Plug the receptor jack into the COM port adapter and then the COM port adapter into COM1 on the P.C. Use the cable included in the MID:COM kit for an extension if needed.
2. Follow the Dallas instructions for software setup if it came directly from them. If using the disk provided in the MID:COM kit, insert the disk in Drive A and execute [start] [run] [A:setup]
3. The setup routine will prompt you through the necessary steps and will have you restart the computer when finished.
4. After the computer starts a window will come up with icons for the Dallas files. You may want to drag iButton32 to the desktop for a shortcut.

5. When you start the program you will have a screen that has a large “VIEW” button in the lower right corner. Insert a button into the receptor and click VIEW.
6. You are presented with two options. Click on “UDP VIEWER”.
7. A window will pop up allowing entry of the I.D. Number. Type in the number watching the digit counter not to exceed 43.
8. When done, click on “WRITE UDP”, close the window and remove the button.