**Floor Model
Automatic Merchandiser**

OWNERS MANUAL

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INTRODUCTION

This machine is a fully electronic, micro-chip controlled, self-testing vendor. It has been designed to provide years of trouble free service. It has an optional dollar acceptor which, when installed, can increase sales volume substantially.

This merchandiser has several technological improvements over previous machines. One improvement is individual motor drives. If one motor fails, the other continues to operate. The new electronic touch pad reduces button jamming and provides for positive selection which minimizes incorrect purchases by the customer. The electronics enable you to individually price each selection.

The security of the machine has been enhanced by a 3 point high security locking system.

POWER REQUIREMENTS: 3 Amps at 115VAC - 60HZ
                                             3 Wire Grounded Outlet

1.   After you have unpacked the equipment plug in the electrical cord.

2.   Retrieve the keys taped inside the product delivery door on the front of the machine. (see fig. 1). There are two sets of keys.

      NOTE: All machines are keyed alike. There are two keys to each lock
      (two for the outer door; two for the electronic panel).

3.   The main door is equipped with a T handle lock (fig. 2) insert the key and turn to open. The handle will pop out approximately one (1) inch.
      To open door, turn handle and pull out.

              NOTE: If the door seems stuck to the machine, due to the newness
              of the gasket, it may need to be opened the first time with a flat tip
              (standard) screwdriver. Slip the screwdriver between the frame and
              door and gently pry open.
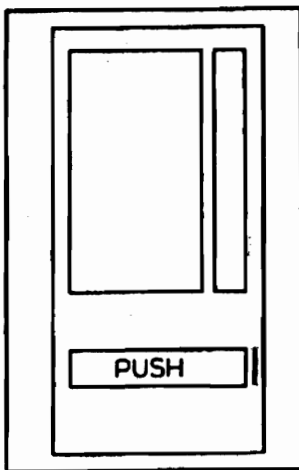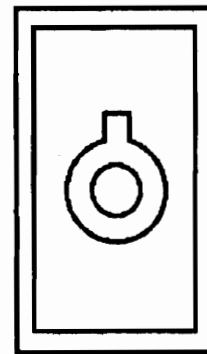
(fig. 1)   (fig. 2)

4.   After the outer door is open, remove the two 1/4 inch hex-head shipping screws, located at the top and bottom of the inner door.

5.   Remove the tape used to secure the coils to the shelf.

      NOTE: The tape securing the light cover and the plastic clips securing the shelves (2 clips per shelf)
           SHOULD NOT be removed until the machine is placed on location. Removing these securing
           devices could cause damage to the light cover and/or the shelves during delivery to your account.

6. Unlock and open the inner door. Turn the key 1/4 turn to the right and open door. This exposes the control systems, coin mechanism and the money box.

INITIAL TESTING OF THE EQUIPMENT

The equipment has been designed so that several relatively simple tests can be performed to determine if it is functioning properly.

1. **TURNING ON POWER:** The ON/OFF switch is located inside the inner door at the rear and towards the top on the circuit breaker panel (see fig. 3) Press the switch up and the snack compartment light should illuminate.

   NOTE: If the light does not come on, it probably means the bulb was jarred loose in transit, or the light switch is off. See "Trouble Shooting".

2. **SERVICE MODE OPERATION:** The Service mode is entered by pressing and releasing the mode button located on the component side of the controller (see fig. 4). A second depression of the mode button will exit the Service mode and return the controller to the Sales mode. If a period of no keypad activity occurs for 25.5 seconds, the controller will automatically revert to the Sales mode.
   Upon entering the Service mode, diagnostics will be displayed by the controller until an additional Service mode function has been selected. Diagnostics include the number of configured motors, Multi-Drop Bus errors if configured, and defective or jammed motors.

3. **TEST COIN TUBE SWITCHES:** This test is performed to make sure that power is available throughout the entire electrical circuit. The coin tube is the last connection in the electrical chain.
   To perform this test: Coins are dispensed from the inventory tubes by pressing key "1". The controller will display "Coin" and wait for an additional key to be pressed as follows:
   KEY "A" dispenses the left coin tube
   KEY "B" dispenses the middle coin tube
   KEY "C" dispenses the right coin tube
   KEY "D" dispenses the fourth coin tube (if available)

(fig. 3)

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IMPORTANT:
NEVER PLUG THE MACHINE IN WITH
THE POWER ON
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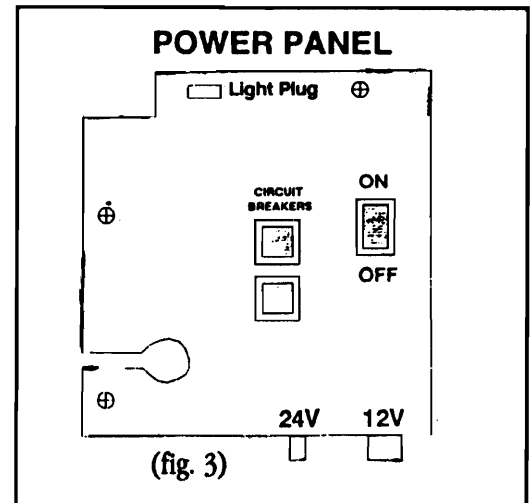
4. **TEST MOTORS BY VENDING EACH COLUMN:**
   To perform this test, you will need 1 roll of quarters and nickels. All vend prices have been pre-set at the factory to 50 cents to speed testing of each column (or coil).
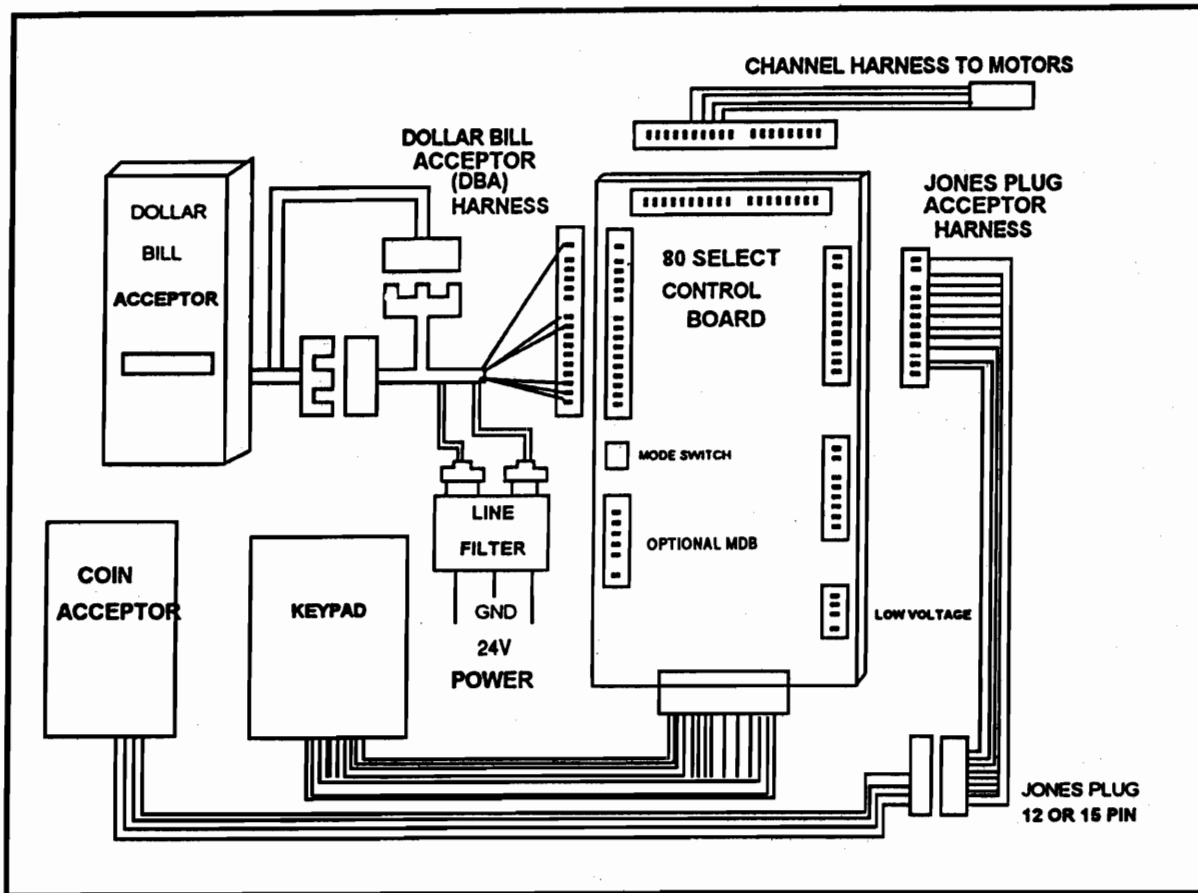   This test will insure that the circuit board, the coin mechanism and the motors are functional. Insert 2 quarters (the display will show a 50 cent credit) and key in each column (or coil) number in sequence starting with A-1. The coil for A-1 will rotate. Continue inserting quarters and keying in A-1 through B-7, etc.

   NOTE 1: Once the vend price is reached, for example 50 cents, the machine will not accept any more coins until a purchase is made. Since all the prices are set at 50 cents, only deposit two coins.
   NOTE 2: After inserting 15 nickels in the coin tubes, the "Exact Change Only" light should go out.
   NOTE 3: Insert the coin, the coil vends and "Credit" does not clear means that the price for that coil was left at zero at the factory. Continue the test by entering the next coil selection number and it will vend. Set pricing for each column later in the procedures.

5. After testing each coil, insert the remaining quarters in the tube. This will give the machine additional change.

(fig. 4)
WIRING DIAGRAM

Diagram labels:

CHANNEL HARNESS TO MOTORS

DOLLAR BILL ACCEPTOR (DBA) HARNESS

JONES PLUG ACCEPTOR HARNESS

DOLLAR BILL ACCEPTOR

80 SELECT CONTROL BOARD

MODE SWITCH

OPTIONAL MDB

LINE FILTER

GND

24V

POWER

COIN ACCEPTOR

KEYPAD

LOW VOLTAGE

JONES PLUG 12 OR 15 PIN

SET UP PROCEDURES

General Information: Inserting quarters in the slot at the top of the quarter tube performs several tests. Testing the motors, assuring the circuit board is working for all coils, making sure the coin mechanism is working and loading quarters into the coin acceptor.

Nickels, dimes and quarters go into the coin acceptor until the coin tubes are full. After the coin tubes are full, additional coins will drop directly to the money box.

OPTIONAL TEST - Dollar Bill Acceptor (DBA)

To perform the preliminary tests of the DBA, insert at least 10 quarters in the slot at the top of the quarter tube. After loading the quarters, observe the back of the DBA. Notice two lights at the bottom. ONLY the light on the RIGHT should be ON. If both lights are on refer to manual.

Next, insert the dollar bill as the graphic on the DBA shows. If the display registers a dollar credit (1.00), the DBA is functioning correctly. Press the coin return to clear the dollar and receive four quarters or make a selection and .50 cents should return.

The procedures to set up the machine include setting the pricing for the control board and placing price stickers under each coil. Perform as much of the initial work, such as price setting, before placing the equipment on location. Therefore, upon arrival at the account, all that's required is to load the machine with product.

Before setting prices, use a Planagram form to determine the items to be placed in the machine and the price for each item. (A copy of this form is included at the rear of this manual)

SETTING PRICES

1.   Open the inner door and locate the control board which is behind the top of the door. On the control board is one red button on the left. Press this "Service Mode" button (see LF80 Control Board diagram, fig. 5).

NOTE: Once pressed, the service mode button will allow 25 seconds to begin setting pricing from the keypad. If 25 seconds have passed, the machine will automatically take itself out of the Service mode. Press the red button again and continue setting prices. All prices entered before the 25 second lapse are stored on the control board.

2.   To begin the price setting procedure press key "4". The controller will display "Prc" and wait for a selection to be entered. Once the selection is entered, the current price will be displayed. The price is then increased or decreased using the "UP" or "DOWN" arrow keys. Pressing the arrow keys for longer than 2 seconds, accelerates the price setting by a factor of 10. (In can drink only mode, the price is increased or decreased using the number key of the current selection. Each time the number key is released and then pressed, the direction of change is reversed. Pressing the number key for longer than 4 seconds, accelerates the price setting by a factor of 10.) To save the price and exit this mode, press another function key or exit the Service mode. Pressing a letter key for another selection saves the current selection price and allows the price of the next selection to be set. The maximum price is set at $99.95. A motor or vend mechanism need not be present in order for a selection price to be programmed.
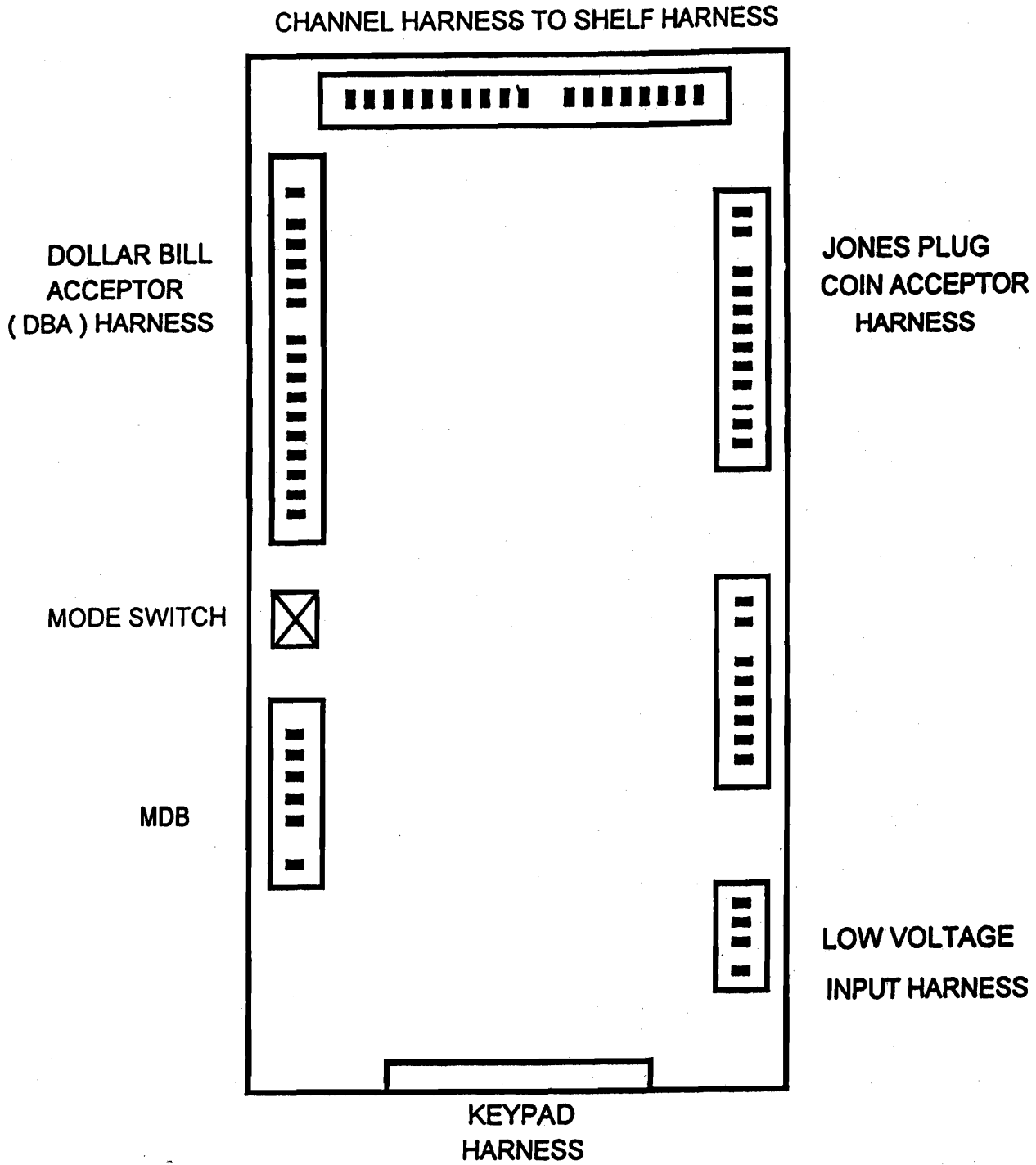
PRICE STICKERS

A pre-printed sheet of prices is included with the machine. Insert the prices needed into the channel on the front of shelf.

MONEY BOX

The coin box is located below the coin acceptor. To access it you must open the inner door.

LF 80
CONTROL BOARD

CHANNEL HARNESS TO SHELF HARNESS

DOLLAR BILL
ACCEPTOR
(DBA) HARNESS

JONES PLUG
COIN ACCEPTOR
HARNESS

MODE SWITCH

MDB

LOW VOLTAGE

INPUT HARNESS

KEYPAD
HARNESS

(fig. 5)

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LF 80 CONTROL BOARD SPECIFICATIONS

1. SALES MODE OF OPERATION

A. Credit Accumulation

A.1 Credit may be accumulated through either a coin changer, bill acceptor or card reader mechanism. Card reader credit cannot be mixed with coin and bill credit during a single vend.

A.2 Credit acceptance will be disabled when the accumulated credit equals or exceeds the highest priced item. If using an executive or "Protocol A" type coin mechanism, credit acceptance is controlled by the changer.

A.3 With the exception of Multi-Drop Bus, the bill acceptor will be enabled when a combination of the least value coin and one other coin type are available in the changer. For domestic use this translates to nickels and dimes or nickels and quarters.

A.4 When using Multi-Drop Bus peripherals, cash box coins and bills are enabled on an individual basis according to the inventory coins available. Cash box coins and bills will be enabled if the coinage currently held in the changer's inventory tubes is greater than the coin or bill to be accepted, plus the credit currently accumulated by the controller.

A.5 If the amount of card reader credit available exceeds the maximum displayable credit, the maximum credit will be displayed.

B. Display Activity

B.1 **Idle State:** The display will show the accumulated credit amount when no keypad or vend activity is present. If no credit has been accumulated, zeros will be shown along with the designated decimal point. The format is dependent upon scale factor and decimal point position provided by the peripherals connected.

B.2 **Keypad Echo:** When a letter key is pressed the display will show the selected character in the second leftmost digit. This character will remain for 5 seconds or until another key is pressed. If a number key is entered after a letter, the pair will be shown on the display.

B.3 **Vend Process:** After a keypad entry is made the controller will determine if sufficient credit is available and the status of the selection. If the accumulated credit is greater than or equal to the selection price and the selection is present, a vend attempt will be made for that selection. During this time, the selection will be shown on the display. If credit is less than the selection price, the price will be flashed for 3 seconds or until a new selection key is pressed. If the motor is bad, the selection and the "MAKE ALTERNATE SELECTION" LED wil be flashed for 3 seconds or until a new selection key is pressed.

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B.4 Change Payment: Depending on the status of the "Fast Change" option, change may be returned before or after a successful vend. The amount of change to be returned will be displayed until all coinage is paid back.

B.5 Use Correct Change LED: If the level of the changer's least value coin tube is below the lowest sensor, the "Use Correct Change" LED will be illuminated continuously.

B.6 Power-up and Reset Initialization: Following a power-up or reset condition, the display will show"------" until the peripherals and controller have been initialized.

B.7 Token Vends: (Applies to the MDB version only) Following the acceptance of a token by an MDB peripheral, the display will show "FrEE" as the accumulated credit. Further credit acceptance is disabled and a single item may be selected to vend for the token credit.

C. Internal Vend and Cash Counters

Following a successful vend, the vend counter will be increased by one and the cash counter will be increased by the price of the selection vended. Counter rollover occurs at 99,999,999 and $999,999,95 respectively. (Note: Test vends are not included in the counter totals.)

D. Options

D.1 Force Vend: The "force vend" option prevents escrow attempts of any credit accumulated by the controller. Once credit is deposited, the customer must choose a selection to vend. In the event that a vend fails on a selection, the force vend feature will be disabled. This will allow the customer to receive credit back if the item they desired cannot be vended properly. Force vend does not apply to credit accumulated by the card reader mechanism.

D.2 Bill Escrow: Disabling the "bill escrow" option takes the current bill directly to the stacker regardless of the maximum selection price. Credit may then be escrowed by the changer if desired. This feature allows the controller to operate in a "bill changer" type mode. Enabling the "bill escrow" option allows the controller to operate in a normal manner by holding a bill in escrow as needed. In situations where multiple bills may be accepted, the last bill that puts the accumulated credit greater than or equal to the maximum price will be held in escrow.

D.3 Multi-Vend: The "multi-vend" option allows the customer the option to vend multiple items without re-entering credit. Change will not be returned immediately after a vend and credit will remain on the display for up to 20 seconds. Escrow attempts will be valid at any time or change will be returned after 20 seconds of no vend activity. Multi-vend mode does not apply to credit accumulated by the card reader mechanism.

D.4 Free Vend: The "free vend" option allows the customer to free vend items in the machine with no credit input. Any selection may be vended by entering it's corresponding selection number,i.e."A1". The message "FrEE" will be shown on the display and all credit acceptance will be disabled whenever the "free vend" option is enabled. Disabling the "free vend" option will return the controller to the normal sales mode.

D.5 Pulse Vend: (Applies to the MDB version only) The "pulse vend" option allows the controller to output a pulse (24 ± 4 VDC) for a user-programmable period of time (50mS. to 2.5 Sec.) to any motor selection. No "home" detection is required and the selection number will be displayed for the duration of the pulse. Selections will be

flagged as bad or failed vends if the selection is currently in the configuration but is not detected at the start of a vend. Enabling the "pulse vend" option provides pulse capability for all motor selections. Selections cannot be mixed between pulse vends and motor vends. Disabling the option returns the controller to the normal motor vend configuration.

D.6 **Fast Change:** (Applies to the MDB version only) The "Fast change" option provides the capability for the controller to payback change prior to starting a vend. If change is returned before the vend, the selection price is subtracted from the accumulated credit and the remainder paid as change. Should the vend fail, the selection credit is returned to the display and made available for payback or another selection.

2. SERVICE MODE OPERATION

The Service mode is entered by pressing and releasing the mode button located on the component side of the controller (see fig.4). A second depression of the mode button will exit the service mode and return the controller to the sales mode. If a period of no keypad activity occurs for 25.5 seconds, the controller will automatically revert to the sales mode.

Upon entering the service mode, diagnostics will be displayed by the controller until an additional service mode function has been selected. Diagnostics include the number of configured motors, Multi-Drop Bus errors if configured, and defective or jammed motors.

Entrance to the Service mode clears the current credit and disables all credit acceptance. Selection motors are automatically configured upon power-up and reset. Multi-Drop Bus errors are cleared upon exiting the service mode. The following table lists the Multi-Drop Bus errors that may be displayed in the diagnostics mode.

Multi-Drop Bus Error	Display
Invalid changer scale factor	"CScf"
Defective coin tube sensor	"tSnS"
Coin jam detected	"CJAM"
Coin tube jam detected	"tJAM"
Coin acceptance problem detected	"CnEr"
Acceptor unplugged	"AcEr"
Coin changer ROM checksum bad	"ChEr"
Invalid acceptor scale factor	"bScF"
Defective bill sensor	"bSnS"
Bill jam detected	"bJAM"
Bill stacker is full	"StFL"
Bill cash box is out of position	"CShb"
Bad bill motor detected	"bMtr"
Bill acceptor ROM checksum bad	"bLEr"
Invalid card reader scale factor	"rScF"
Card error detected	"CdEr"
Invalid card detected	"bCrd"
Card reader jam detected	"rJAM
Communications error detected	"CoEr"
Card reader failure	"brdr"

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The following list of functions are available while in the service mode.

A. Coin Dispensing: Coins are dispensed from the inventory tubes by pressing key "1". The controller will display "Coin" and wait for an additional key to be pressed as follows:

KEY "A": dispenses the left coin tube
KEY "B": dispenses the middle coin tube
KEY "C": dispenses the right coin tube
KEY "D": dispenses the fourth coin tube (if available)

For Multi-Drop Bus capability:

KEY "A": dispenses the lowest value coin tube
KEY "B": dispenses the next highest coin tube
KEY "C": dispenses the next highest coin tube
KEY "D": dispenses the highest value coin tube (if available)

Coins will be paid out at a rate of approximately 2 per second as long as a key is pressed.
To exit this mode press another function key or exit the service mode.

B. Motor Count: The total number of motors configured will be displayed by pressing key "2". The controller will test each motor in the configuration to determine if a valid motor is connected. The number will then be displayed in the two center most digits of the display.
To exit this mode press another function key or exit the service mode.

C. Accountability: Vend count and cash total accountability will be displayed by pressing key "3". The controller will be display "Acct" and wait for an additional key to be pressed as follows:

KEY "A": displays the vend count
KEY "B": displays the cash total

The counters will be eight digit numbers displayed as the upper four for 2 seconds followed by the lower four (with decimal point) for 2 seconds. These two fields will alternate every 2 seconds until this mode is exited.
To exit this mode press another function key or exit the service mode.

D. Price Setting: To begin the price setting procedure press key "4". The controller will display "Prc" and wait for a selection to be entered. Once the selection is entered, the current price will be displayed. The price is increased or decreased using the "UP" or "DOWN" arrow keys. Pressing the arrow keys for longer than 2 seconds, accelerates the price setting by a factor of 10. (In can drink only mode, the price is increased or decreased using the number key of the current selection. Each time the number key is released and then pressed, the direction of change is reversed. Pressing the number key longer than 4 seconds, accelerates the price setting by a factor of 10.) To save the price and exit this mode, press another function key or exit the service mode. Pressing a letter key for another selection saves the current selection price and allows the price of the next selection to be set. The maximum price is set at $99.99. A motor or vend mechanism need not be present in order for a selection price to be programmed.

E. Single Motor Test Vend: To test a single selection, press key "5". The controller will display "SLct" and wait for a selection to be entered. Once the selection is entered, a vend of the motor will be attempted. If the vend is successful, the controller will blank the dis play and exit the test vend mode. If the selected motor fails, the controller will display "FAiL" for 2 seconds and then wait.
To exit this mode without vending a motor, press another function key or exit the service mode.
NOTE: Test vending a selection that has been flagged as bad will reset the flag if the motor successfully completes a vend cycle.

F. Machine Test Vend: To test vend all configured motors within the machine press "6". The controller will display each selection as a vend attempt is made. If the vend is success ful, the controller will continue on with the next selection. If the selected motor fails, the controller will display "FAiL" for 2 seconds and then continue. When a vend attempt on all motors has been completed, the controller will blank the display and exit the test mode.
To exit this mode, press another function key and hold until the current vend is completed or exit the service mode.

G. Vend Options: To enable or disable the vend options, press key "E/11". The controller will display "OPtn" and wait for an additional key to be pressed as follows:

KEY "A/7": toggles the "Force vend" option ON/OFF
KEY "B/8": toggles the "Bill escrow" option ON/OFF
KEY "C/9" toggles the "Multi-vend" option ON/Off
KEY "F/12": toggles the "Free vend" option ON/OFF

Feature	Display
Force vend enabled	"Frcy"
Force vend disabled	"Frcn"
Bill escrow enabled	"EScy"
Bill disabled	"EScn"
Multi-vend enabled	"MULy"
Multi-vend disabled	"MULn"
Free vend enabled	"FrEy"
Free vend disabled	"FrEn"

To exit this mode, press another function key or exit the service mode.

Moving To Location

1. Fasten Clips. Make certain that the clips holding the shelves are securely fastened. A 7/16 socket will screw (or unscrew) the clips.

2. Fasten Light. Make certain that the shipping tape securing the light cover is secure. Otherwise, put new tape on the light to keep it from jarring loose.

3. Protecting Finish. If moving the machine on its side, use some of the shipping materials to place under the machine so that the finish is not scratched.

4. Display Window. Never move the equipment with the machine laying on its display window.

New Location

1. Remove Clips. Be sure to remove all the shelf clips. Screw the bolt on the clip and store in the bottom of the machine in case the machine is moved in the future.

2. Stock Machine. Price the vends prior to taking the machine to the account. Also practice stocking the machine prior to going to the account.

Clean the machine as follows:

DELIVERY COMPARTMENTS - CHECK EACH SERVICE - Examine these columns during each servicing of the machine.

DISPLAY WINDOW - CHECK EACH SERVICE - Clean as needed to properly display product. Always use soft cloth and liquid soap in water.

> **IMPORTANT NOTE:** DISPLAY WINDOW CLEANING
> NEVER use paper towels or glass cleaner.

CABINET - CHECK EACH SERVICE - A machine in non office environments will require more frequent cleaning.

SHELVES - MONTHLY - Lift each coil and clean the shelf with a product such as 409. Some vend products such as chips may leave an oil residue in normal vending.

TROUBLE SHOOTING is the maintenance form of detective work. Sometime the problem may be obvious, other times it requires pursuing several options. This section describes the following problems:

FAILED MOTOR	COIN JAMMED - Bottom of Mechanism
KEY PAD	JAMMED COIL (with product in coil)
COIN MECHANISM - Refusing Money	TRIPPED CIRCUIT BREAKER
COIN DEPOSITED - No Credit Given	SNACK COMPARTMENT LIGHT

COINS JAMMED where COIN ACCEPTOR & COIN CHANGER MEET

FAILED MOTOR

A vend motor is not turning if the LED read out on the door front says *"make another selection"* after that selection has been pressed in. Review the failed motor flow chart to assist in determining the problem.

To test the motor, open the outer door and reach through the middle of the coil. Turn the motor clockwise approximately one inch. If it will not turn clockwise, pull the shelf out an inch, then try to turn it again an inch in the same direction.

Won't Turn: Replace the motor.
Turns: Try vending a selection. The motor should turn.

CYCLING THE MOTOR: If the motor turns properly, and it still isn't vending, attempt to cycle the motor. Reach inside the door and press the red button on the control board and wait 25 seconds. During this 25 second period, the control board is testing all of the circuits. After the 25 second interval place money in the machine and make a selection. This will sometimes un-jam the motor. If this does not solve the problem, have the machine return money by pressing the coin return. Press the red button once more and run the price of the chosen item all the way through zero. Wait 25 seconds until you hear a click. When the zeros flash and returns to zero, press the letter and number for the selection. If the motor is still not working properly, test the motor by following these steps:

SWITCHING MOTOR WIRES (see FIG. 6) This test determines if the motor is bad or a bad control board.

1. Remove the product shelf to gain access to the motors. (Refer to "Shelf Removal" to remove a shelf).
2. Disconnect the electrical wire from the motor to be tested.
3. Disconnect a wire from an adjacent motor you know is working and connect to the motor to be tested.
4. Replace the shelf and retry the selection.

MOTOR STILL DOES NOT TURN: The motor is faulty and must be replaced. See "Motor Replacement".

MOTOR NOW TURNS: The motor is good and the problem is in the control board or electrical wiring. Reconnect the wires to their original motors. Replace the control board and retry the selection and the motor should turn. If the motor still does not turn, there is probably an electrical wiring problem and a professional should be contacted.

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Switching Motor Wires

Original Position   **Switched Position**

Working Motor

Test Motor

Working Motor

Test Motor
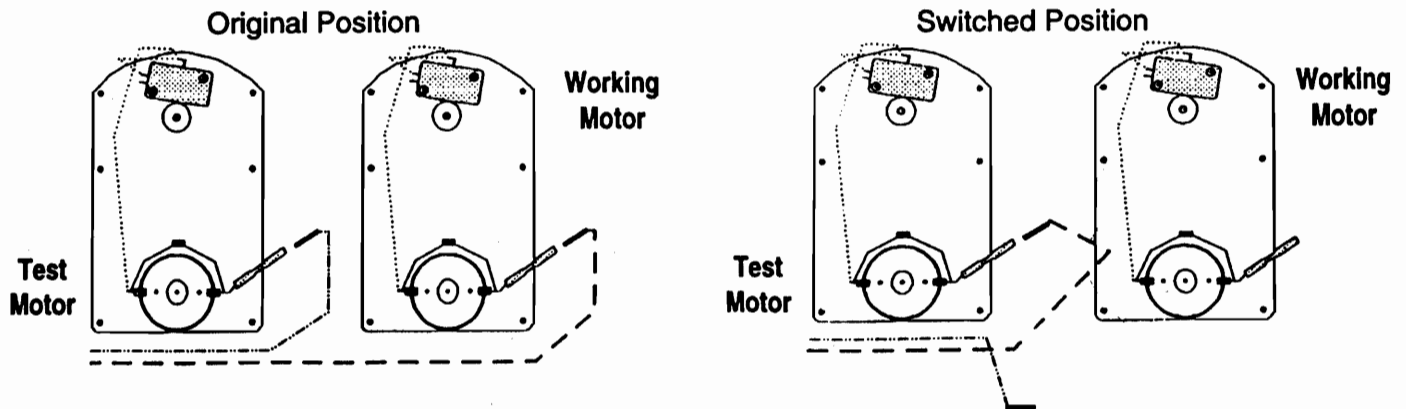
(fig. 6)

KEY PAD

. If the letter A or B, etc. does not disappear on the LED readout after a few seconds or after pressing a letter and number they do not appear at all, there are two possible problems: bent pins or a short in the pad. The key pad's pins were not properly inserted into the control board. Remove the control board and see if any of the pins are bent. If there are bent pins, straighten and re-connect the control board. If there are no bent pins, there is a short in the key pad and it must be replaced.

COIN MECHANISM - REFUSING MONEY

When the machine refuses to accept money, there are two potential reasons. Electrical or bad coin mechanism.

FIRST: Remove the coin mechanism and replace it with a spare. If this solves the problem, the coin mechanism needs repair or replacement. If not, go to the second option.

SECOND: A quick test to se if the unit is receiving power is to dispense coins from the coin tube payout switches. If the coins do not dispense, trace the wires leading to the mechanism to see if there is pwoer to the machine. If the on/off switch inside the inner door is lit and the large light over the vending area is on, then test the 24 volt and the 12 volt power sources, do this by turning the power off and unplugging the main power cord. A volt meter should be set above 24 volts DC. Turn the power back on and use the meter to check 12 volts and 24 volts from the power supply.

HAS ELECTRICITY: Replace the control board.

NO ELECTRICITY:

1. Check the circuit breakers. Retest the coin mechanism.
2. Loose Wires - Next check for loose wires on the board.

COINS DEPOSITED - NO CREDIT GIVEN

When coins are deposited in the machine and they are distributed to the proper coin tubes and the cash box, and no credit is shown on the LED, replace the control board. A remote possibility is a bad coin mechanism.

JAMMED COINS - BOTTOM OF MECHANISM

The coins fall from holes at the bottom of the mechanism and down a metal slide. If there is a jam at this point, the angle of the slide may need to be adjusted backward. Press gently against the slide, pushing it back slightly.

JAMMED COIL (With Product in Coil)

When products such as candy bars and pastries jam in the coil, fill the coil with the product and observe the results of repeatedly vending the product. If it jams again, test the coil to ensure that it is in its proper location, do this by performing an END TO END TEST (see diagram). Remove the coil and turn so the back of the coil is parallel with the floor. Push the coil back in the tray and the coil should go right across the middle screw. Then rotate the coil 180 degrees and it should still hit the screw in the middle. If it doesn't hit the screw in the middle during either test, then the motor needs to be either raised or lowered in the screw slots. Re-test after adjustment to see if alignment is better.

NOTE: If the coil does not touch the same place on the motor after rotating, the coil is bad. The only alternative is to replace the coil.

END-FOR-END TEST
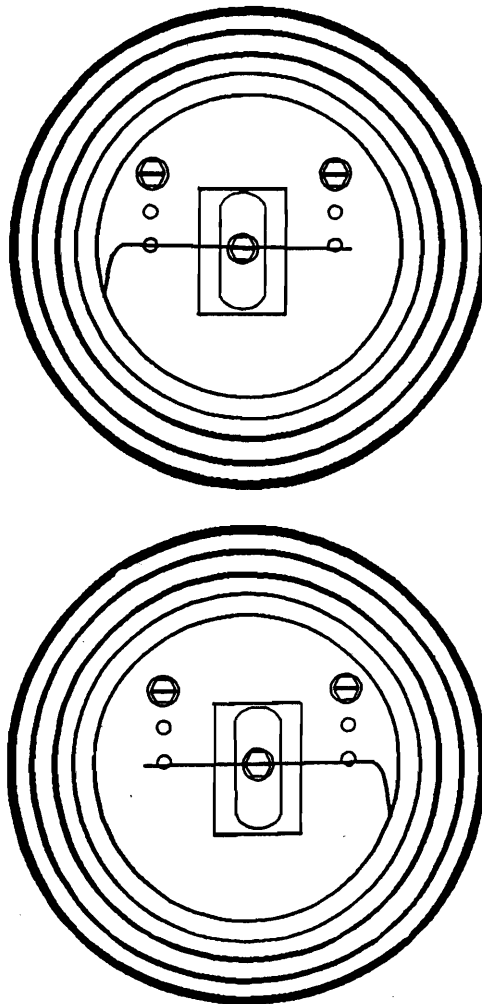
TRIPPED CIRCUIT BREAKER

Press the tripped circuit breaker once. If it trips again, there is a short or a bad circuit breaker. In either case GET AN ELECTRICIAN to correct the problem.

SNACK COMPARTMENT LIGHT

If the light in the snack compartment does not come on, there are four possible problems:
1. Bulb Jarred Loose - Reinsert bulb socket.
2. Bulb Blown - Test with a new bulb.
3. No Power - Test that the unit is receiving power with a volt meter.
4. Entire Fixture Failure - Most probably the ballast has failed and the entire fixture has failed. These failures may happen within the first 60 days.

FAILED MOTOR
TROUBLE SHOOTING FLOW CHART
(WHEN MOTOR WON'T TURN)

Turn Coil By Hand

- **Turns** → **Put in Service Mode Wait 25 Sec. Try Again**
  - **Fails** → **Set Price to "0", Wait 25 sec. Try Again**
    - **Fails** → **Remove shelf, Swap Colored Wire on Motor to Colored Wire from Working Motor. See (C). Try Again**
      - **Fails** → **Replace Motor**
      - **Works** → **Replace Control Board**
    - **Works** → **See (B) Below**
  - **Works** → **See (B) Below**

- **Won't Turn** → **Pull Shelf Out About 1 inch Try Again**
  - **Turns** → **Put in Service Mode Wait 25 Sec. See (A) Below**
  - **Can't Turn** → **Replace Motor**

(A) Motor has failed because it is pushed against the back of the machine. Adjust shelf to relieve pressure.

**(B)** Determine cause for motor stopage. (i.e. product jammed, loose wire or connector.)

(C) Remember the selection number of the failed motor has changed to the selection number of the working motor. When "trying again" use the new number.

COMPONENTS: REMOVAL / REPLACEMENT

This section describes disassembly and reassembly of defective components. To maintain your equipment, you must be able to replace defective components determined through trouble shooting.

To perform these procedures, you will need the following tools:
- #2 - Phillips Screwdriver
- #2 - Standard Screwdriver
- 1/4 - Set & Screw
- 1/4, 5/16 & 7/16 inch - Sockets & Wrench
- Small - Needle Nose Pliers
- Medium - Vise Grips

DO NOT PURCHASE MAGNETIZED TOOLS. Magnetized tools can erase the programming of the control board. When working inside the machine practice electrical safety:

TURN THE POWER OFF AND UNPLUG THE MACHINE

CONTROL BOARD

Removal:

1. Turn the power off and unplug the machine.

2. Unplug the Jones plug connecting the coin acceptor to its power supply.

3. Remove the electrical connections to the control board. The connections are different sizes, and designed so that they can only go in their specific connectors.

4. Remove the four screws holding the circuit board to the inner door.

5. Lift the board away from its mounted position and disconnect the keypad ribbon cable.

Replacement:

To replace the control board, reverse the removal procedures.

KEY PAD REMOVAL / REPLACEMENT

1. Turn the power off and unplug the machine.

2. Remove the control board.

3. Remove the keypad backing plate and peel off old keypad.

4. Put on new keypad, replace the backing plate and four screws, then reattach the control board.

(16)

COIN ACCEPTOR

1. Turn the power off and unplug the machine.

2. Unplug the Jones plug connector. (see diagram)

3. Remove the coin acceptor. Push up on the retainers on opposite sides of the top and pull the coin return actuator with your index finger. The coin acceptor falls forward from the top and will lift up and out.

4. Loosen (don't remove) the three screws attaching the coin acceptor to the machine's frame. Slide the coin acceptor up slightly and pull towards you.

Jones Plug Diagram

Jones Plug

Coin ◀— Acceptor

Mounting Screws
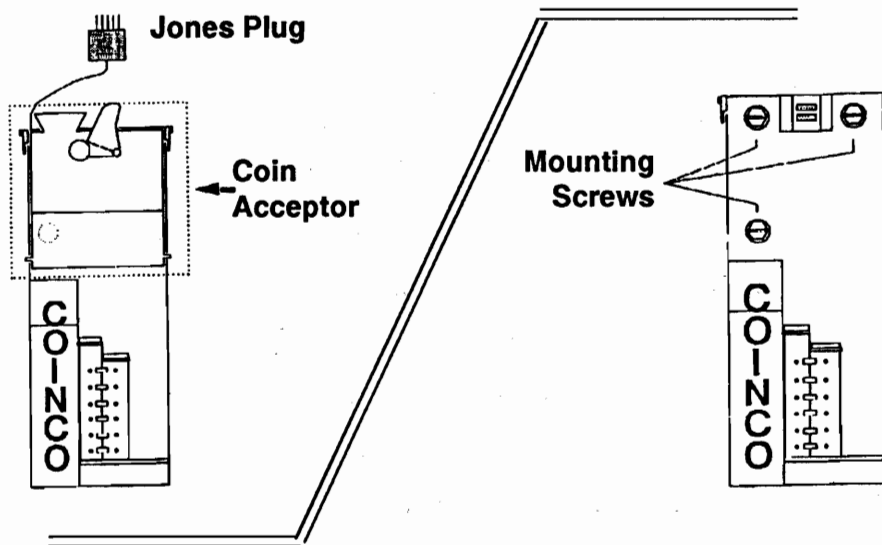
CABINET DOOR REMOVAL

1. Open the cabinet door and unscrew the two bolts on the top, left of the door, holding the door with one hand.

2. Lift the hinge up with your right hand; hold door with left.

3. Lift door off lower hinge pin.

PRODUCT SHELF REMOVAL

1. Remove shipping tape: Remove shipping tape on the right of the shelf holding the shelf harness to the channel harness.

2. Remove electrical connection: Remove the electrical connection plug by pulling straight to the rear of the machine on the electrical connection. The wires on the plug should be pointing up.

3. Physical Removal: Remove the shelf by holding the electrical wire at the middle of the back of the shelf, lift up slightly over the catch, and pull the shelf forward (holding in the middle front.)

4. Pull forward, until you feel the rollers come out of the runners on each side of the shelf. (See diagram below.) Lift and remove shelf.
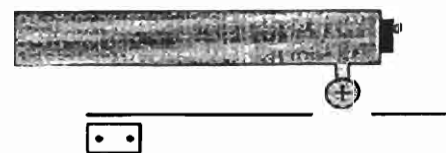
SHELF REMOVAL DIAGRAM

Product Shelf — Runner — Roller

NORMAL POSITION

ROLL BACK AND FORTH

LIFT SHELF FROM RUNNERS

(A)

(B)

(C)

(17)

PRODUCT SHELF REPLACEMENT

1. The shelf slides back similar to a drawer. Make sure the rollers fit on the tracks properly.

2. Insert the electrical plug for the shelf into the frame on the right of the shelf. Make certain that the wires on the plug are pointing up.

MOTOR REMOVAL / REPLACEMENT

1. Turn the power off.
2. Remove the product shelf.
3. Remove the coil.
4. Unplug the colored wire.
5. Unplug the white ground wire.
6. Remove the two screws from the motor.

POWER CORD

*TO DO ANY WORK ON THE POWER CORD, THE MACHINE **MUST BE UNPLUGGED**.* The 115 volt AC power cord furnishes power to the fluorescent light, transformer. There are three wires in this cord: Green, Black and White.

Green Wire: This is the ground wire and hooks on the side panel with a silver clip.

White Wire: This is the common wire and attaches to the on/off switch; entering & leaving the same terminal.

Black Wire: This wire connects to the on/off switch and the 115 volt circuit breaker. It splits from the circuit breaker into:
    1) the transformer 2) snack compartment light, and 3) an extra wire for a possible dollar bill acceptor.

GLASS REMOVAL

1. Remove the door and place it on a flat surface, face down.

2. Remove the nuts from retaining trim.

3. Remove the trim and the glass.

LIGHT FIXTURE REMOVAL

1. Turn the power off and unplug the machine.
2. Detach the electrical plug from the electrical panel.
3. Remove the lens from the fixture.
4. Remove the bulb.
5. Remove the two nuts.

COIL REMOVAL

1. Remove the retainer clip from the motor end of the coil.

2. Slide the coil out of the bracket which attaches it to the motor.

3. Remove coil from tray.

POWER SUPPLY (see fig.3)

1. *TURN THE POWER OFF AND UNPLUG THE MACHINE.* This is the most dangerous electrical part of the machine.

2. Unplug the fluorescent light wire and the 24V wires.

3. ***Note: EXTREME DANGER.*** If the screws and the nuts securing the power supply to the frame are not removed in the proper sequence and with proper precautions, the power supply could fall. This could cause personal injury and damage.

    A. Remove the 1/4" screw at the top left.
    B. Loosen the 5/16" nut at top right.
    C. Place thumb against the panel on the middle left side.
    D. Remove the 1/4" screw at the bottom left.
    E. Remove the 5/16" nut.
    F. Grasp the power supply from underneath.
    G. Tilt top back and remove 110 volt power cord connections.

NOTE: Power supply contains a transformer and is <u>heavy.</u>

DEFINITIONS

POWER SUPPLY: An alternative name is the power panel. The panel contains the circuit breakers, on/off switch and transformer.

BILL OF LADING: The shipping papers that you receive for products or equipment sent by common carriers. (such as trucking lines.)

CPU: Central Processing Unit - The circuit board is also referred to as the CPU - where all control commands are processed and memory data is stored.

CONTROL BOARD: This board is the central control devise of the automatic merchandiser.

COLUMN: A term that is used to describe the slot on the shelf where the coil is contained and the product dispenses.

END TO END TEST: A method to test the alignment of coils on the shelf.

GRAPHIC PANEL: This is a plastic overlay on the front of the machine.

JONES PLUG: The electrical connection plug for the coin acceptor.

LINE FILTER: This is similar in appearance to a cable TV splitter. It is attached to the back of the circuit breaker panel when a DBA is installed. It has three connectors on top and two on the bottom.

SELECTION PANEL: Locked panel inside of the main door that contains all control circuitry.

DBA: Dollar Bill Acceptor. Allows machine to vend with paper currency.

COIN MECH: Coin Acceptor. Coinco 9302L and 9302L+.
Allows machine to vend when proper change is inserted.

DIAGRAMS & SCHEMATICS

The following diagrams and schematics are provided:

1. Failed Motor Flow Chart. (pg. 15)

2. Planagram (form) (pg. 20 & 21)

3. Control Board (pg. 5)

4. Coin Acceptor (pg. 17)

5. Power Panel (front view) (pg. 2)

6. Wiring Diagram (pg. 3)

PLANAGRAM

MACHINE _____   LOCATION _____

A
SHELF

PRODUCT TYPE

OF PRODUCTS

VEND PRICE

B
SHELF

PRODUCT TYPE

OF PRODUCTS

VEND PRICE

C
SHELF

PRODUCT TYPE

OF PRODUCTS

VEND PRICE

D
SHELF

PRODUCT TYPE

OF PRODUCTS

VEND PRICE

E
SHELF

PRODUCT TYPE

OF PRODUCTS

VEND PRICE

(20)

PLANAGRAM

MACHINE _____   LOCATION _____

A SHELF

PRODUCT TYPE

\# OF PRODUCTS

VEND PRICE

B SHELF

PRODUCT TYPE

\# OF PRODUCTS

VEND PRICE

C SHELF

PRODUCT TYPE

\# OF PRODUCTS

VEND PRICE

D SHELF

PRODUCT TYPE

\# OF PRODUCTS

VEND PRICE

E SHELF

PRODUCT TYPE

\# OF PRODUCTS

VEND PRICE

(21)

INSTALLING D.B.A.
(Dollar Bill Acceptor)

1. Turn the power off and unplug the machine.

2. Open the outer and inner doors.

3. Locate the cut-out slots on the back side of the inner door (selection panel) below the key pad. Use a flat tipped (standard) screwdriver to pry off metal cut-outs.

4. Use a razor knife to cut through the graphic panel.

5. File rough edges smooth with a metal file, if needed.

6. Screw the four metal standoff's supplied with the DBA to the four studs on the back side of the selection panel. Tighten securely, but <u>do not over tighten.</u>

7. Apply dollar bill picture to the graphic panel just above DBA cut-out.

8. Insert DBA through the selection panel opening and attach to the standoffs with the four #8 nuts supplied.

9. Connect the DBA power harness.

10. Check all connections.

11. Plug in machine and turn on power.

12. Test operation of DBA (see *Optional Test - DBA* under "Equipment Testing")

DESCRIPTION	PART NUMBER
MOTOR	EL 430
CONTROL BOARD 80 SELECT	407733

COILS

INCHES	PRODUCTS	
1 7/8	16	01
1 7/8	12	07
2 3/8	11	8401
2 3/8	8	8406
3 1/2	6	8308
3 1/2	5	8307

SHELVES

MODELS FM345 & FM7200

9 COLUMN	64-3009-00
7 COLUMN	64-3007-00
5 COLUMN	64-3005-00
4 COLUMN	64-3004-00

MODEL FM 1462

6 COLUMN	67-3006-00
4 COLUMN	67-3004-00
3 COLUMN	67-3003-00

KEYPAD 80 SELECT	10-3209-11
CIRCUIT BREAKERS	10-3305-00

LOCKS

INNER DOOR	10-4102-02
OUTER DOOR	10-4101-03
PRICE LABEL SHEETS	10-5303-08

FOR COMPLETE PARTS INFORMATION CALL:
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WARRANTY LIMITED

Savamco Manufacturing Incorporated, warrants this equipment to the ORIGINAL PURCHASER only, for a period of one (1) year from the date of shipment to be free from significant defects in materials or workmanship, two (2) years on the electronic components, two (2) years on vending motors, three (3) years on compressors to the extent such parts are warranted to Savamco Manufacturing Incorporated, except for light bulbs and fuses.

Should any part prove defective within the warranted period, Savamco Manufacturing Incorporated, will repair or replace (at its option) the defective part but will not provide the labor, removal or reinstallation cost associated with such parts. All returned products or parts must be shipped prepaid to Savamco Manufacturing Incorporated, and Savamco will then prepay the shipping cost of the returned goods. Savamco Manufacturing Incorporated, reserves the right to refuse any collect shipment. Any part returned under the terms of this warranty should be accompanied with a brief description of the defect or failure along with the model and serial number.

This warranty applies only if the equipment is serviced and maintained in strict accordance with the instructions given in the Savamco Manufacturing Incorporated manual and that no unauthorized repair or disassembly has been done. Any defect caused by improper source of power supplied, abuse of product, accident, alteration, vandalism, mineral build-up, or improper cleaning or service technique will not be covered by warranty.

Savamco Manufacturing Incorporated, service or repair to items not in warranty will be subject to the standard service charge for repair of the failed components. For service and or warranty information, write or call Vending Equipment Services at (218) 768-4899.