Instructions to Install Retrofit Kit
National 148 Machine

****TURN POWER OFF OF MACHINE BEFORE INSTALLATION****
READ ALL INSTRUCTIONS BEFORE STARTING INSTALLATION

Retrofit Kit Contents

PART NAME	QUANTITY	PART NUMBER
PCBA, Snack Retrofit MEIH/Drop Controller	1	10-0062-02
with standoffs	4	08-0610-00
and nuts	4	08-0632-01
Cable, Nat'l 147 Keypad	1	11-0190-21
Cable, Nat'l 147 Door	1	11-0191-21
Cable, Nat'l 147 Motor	1	11-0192-21
Cable, Nat'l 147 Power	1	11-0193-21
Cable, Nat'l 147 Display	1	11-0194-21
Cable, MDB Ext	1	11-1700-06
Cable, Sensor	1	11-0197-21
Assembly, Nat'l 147 Display	1	05-1131-00
Lens, Nat'l 147 Display	1	05-0132-00
Plate, Nat'l 147 VMC	1	05-0133-00
With standoffs,	4	08-0440-43
Nuts	4	08-0440-01
And screws for VMC	4	08-0440-00
Front Cover, 4/5/6/7000	1	05-0125-00
Cable Assembly, DEX	1	DEX-27-EL
Washer for cable mounting	1	08-5075-00
Screws for front cover and	4	08-0632-00
Relay PCBA	1	10-0071-00
Kit, Nat'l 148 Sensor	1	10-0069-01
FOR MICROMECH OPTION ONLY		
Cable, Nat'l 147 Micromech	1	11-0195-21
Cable, Nat'l 147 Pulse BV	1	11-0196-21

Tools Needed: Nut Driver, ¼" and 3/8"
Screwdriver, Philips

1. Fully open the vending machine door.

2. Locate the sliding plate within the top right of the machine. Unplug the three cables connected to the Vending Machine controller (VMC) on "front" and "bottom" side. This will allow the bracket to fully slide out.

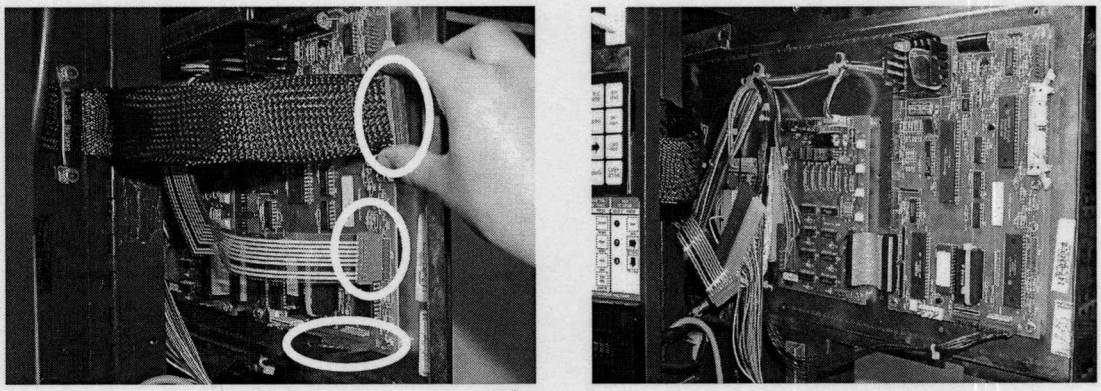


Figure 1.

3. Remove all connections made on the first two boards on this sliding plate. Using a Philips screw driver, the original VMC and Motor Interface board, the board to the left of the control board, may now be removed. Set the boards safely aside. Save all hardware.

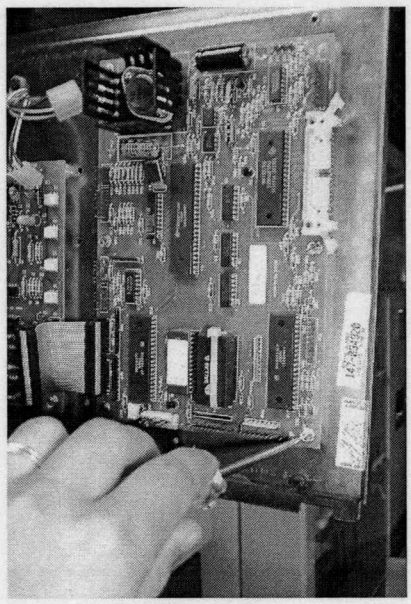


Figure 2.

4. Locate the Relay board within the kit. This will mount where the Motor Interface board was originally. Using the original hardware, mount the Relay board. See Figure 3 for correct orientation. (The 18 pin connector, J3 will be toward the bottom of the machine).

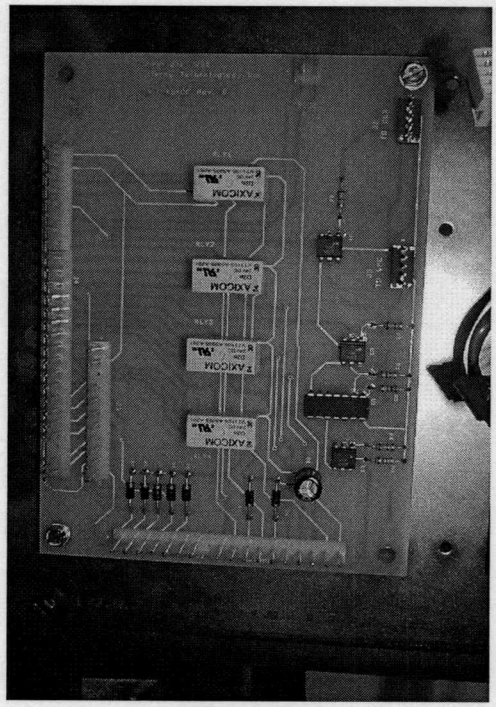


Figure 3.

5. Locate the VMC Plate, 05-0133-00, within the kit. Using the original hardware, this will be installed where the original board was mounted (six screw locations).

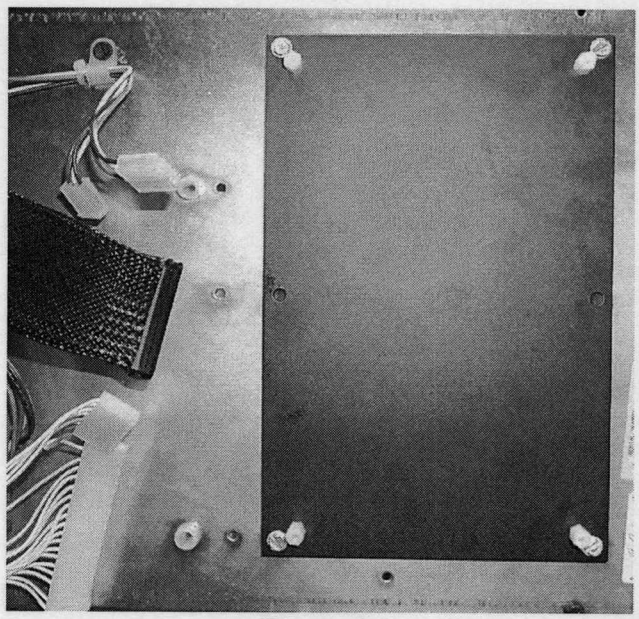


Figure 4.

6. Locate the VMC in the kit. This will mount onto the plate. See Figure 5 for correct orientation (MOTOR and POWER headers towards bottom). Use four of the screws, 08-0440-00, that are already installed in the standoffs on the plate.

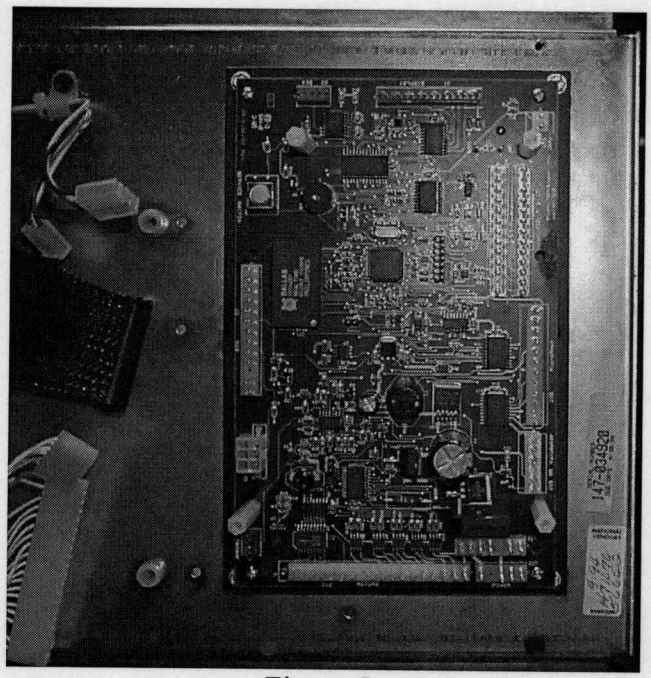
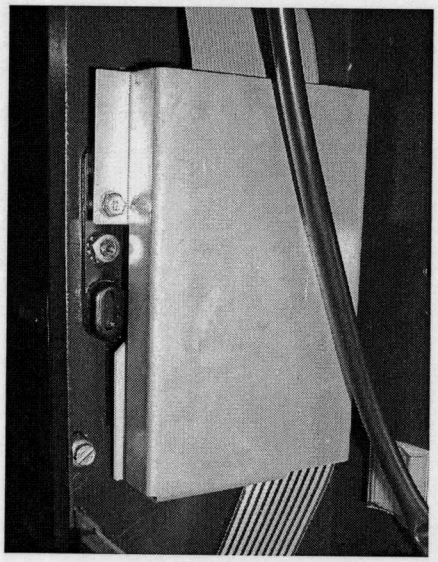


Figure 5.

7. On the front panel of door, locate the aluminum cover mounted behind the display. This is mounted by two screw locations. Using a nut driver, remove the two screws and the cover. Refer to Figure 6.



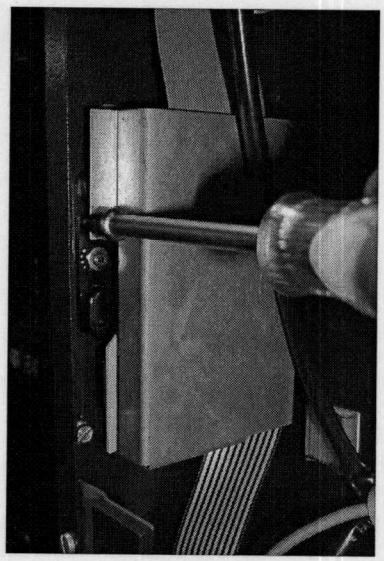
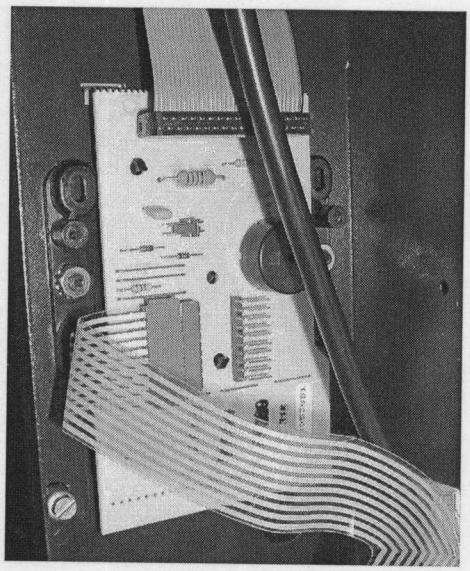


Figure 6.

8. Next, remove all connections to the display board and remove this board. The black plastic mounting bracket must also be removed, which is being held in place with two nuts. When removing these nuts, set them safely aside (they will be needed later).



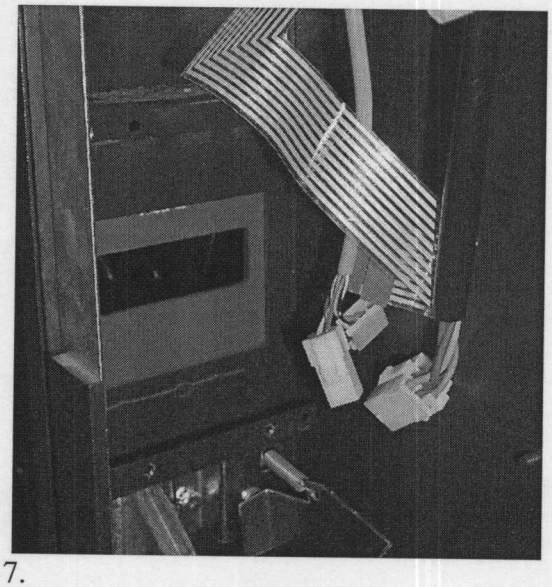


Figure 7.

9. The bill validator will also have to be removed. This has four screw locations; all of which may or may not be used. Remove whatever screws are present so the validator can be removed from the machine.

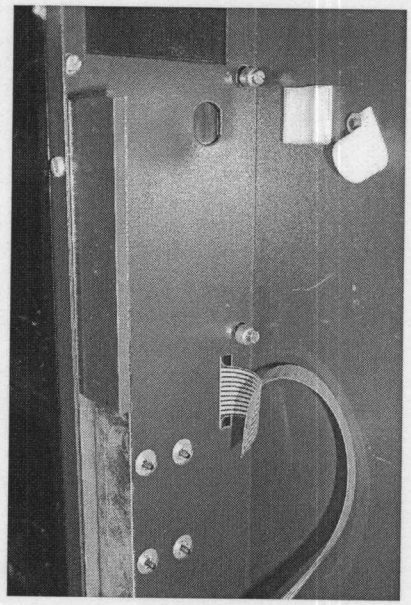


Figure 8.

10. Locate eight caps and screws along this front panel. These screws are attaching the front cover to the front panel. Using, a Philips screw driver, remove the screws and caps in order to remove the display lens, shown below in Figure 9. This will be replaced with 05-0132-00, included in the kit and shown in Figure 10. Once the 05-0132-00 is in position, the caps and screws can be replaced. Please make sure it is secure in its place before securing the screws.

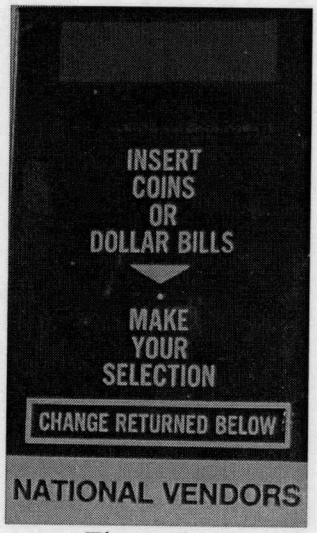


Figure 9.

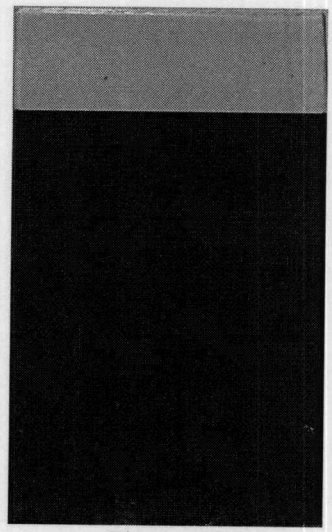


Figure 10.

11. The display assembly, 05-1131-00, must now be installed. Using the two threaded screws that held the black mounting bracket in place (from Step 8) and secure it with the two original nuts. Make sure the display is facing through the front of the machine. Refer to Figure 11.

Figure 11.

12. Connections to the relay board can now be completed.
    - There will be a cable with a large connector (20 pins) and a smaller one (6 pins) located near the left side of the board. This will plug into J4 of the relay board. Pin 3 is keyed.
    - Another cable already within the machine with 11 pins, pin 3 keyed will plug directly into J3 of the Relay board.
    - Locate 11-0191-21 in the kit. This cable will connect J1 of the relay board to J16 of the VMC.
    - Locate 11-0192-21 in the kit. Both ends will have a total of 18 pins, with pin 11 keyed. The cable is <u>one-to-one</u>. This will connect J2 of the relay board to J12 of the VMC. Please make sure pin 1 of each board is connected to each other.
    - Locate 11-0197-21 in the kit. This will plug into J5 of the Relay board. The other end will connect to J2 of the VMC.
    - J6 will be plugged in later in this procedure.

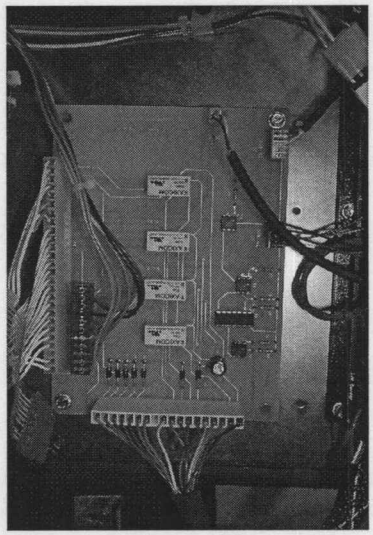


Figure 12.

13. Cable Connections:
    - 11-0190-21 is a cable with a 10 pin male connector at 0.100" spacing on one end and a 13 pin connector at 0.156" spacing. The male connector will plug directly into the keypad tail. There will be a triangle marking on the tail connector and the cable connector to indicate pin 1. Please make sure these markings are matched up. The other end will plug into J4 of the VMC.
    - 11-0193-21 is a cable with a 5 pin connector on one end and a 4 pin connector on the other end. Both connectors are 0.156" spacing and keyed. The 5 pin end will plug directly into J17 of the VMC. The 4 pin will plug into an already existing cable in the machine that plugged into J55 of the original control board. It will be a 4 pin connector with pin 3 keyed (1-Orange, 2-Yellow, 4-Brown).
    - 11-0194-21 is a cable with 16 pin connectors on either end. Plug one end into J1 of the VMC. The other end will plug directly into the display. Please make sure pin 1 of each connector is matched up.

14. Money Acceptor Connections:
    - **J18** – This header will be used if a **Micromech** coin mech is being used. 11-0195-21 will be needed for this connection. The cable that originally plugged into J56 of the original control board will mate with the male connector of 11-0195-21. The other end will plug directly into J18 of the VMC.
    - **J15** – This header will be used if a **pulse bill validator** is being used. 11-0196-21 will be needed for this connection. There will be a ribbon cable coming from the bill validator with a small module at the end. On this module, there is a 2 x 9 header. There is a mating connector on one end of 11-0196-21 that will plug into this header. The other end will plug directly into J15 of the VMC.
    - **J5** – This header will be used if **MDB money acceptors** are being used. 11-1700-06 will be needed to extend the 2 x 3 cable that will be coming from the MDB coin mech and/or bill validator.

15. Locate 10-0069-01 in your kit.

16. On either side of the bin, remove the deflector plate by removing three screws. Do this for both sides. Refer to Figures 13 & 14.

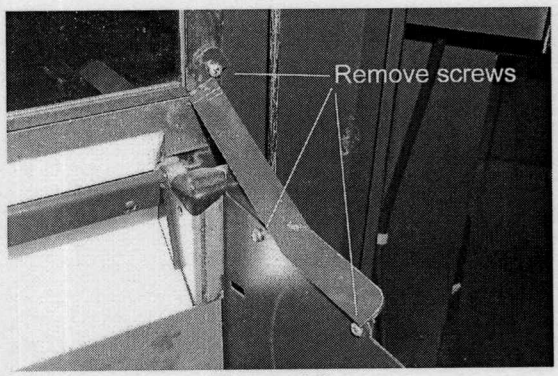


Figure 13.

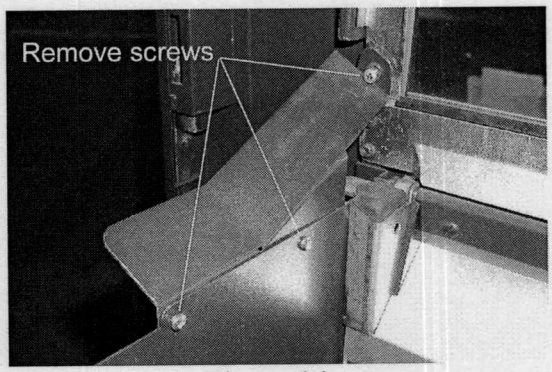
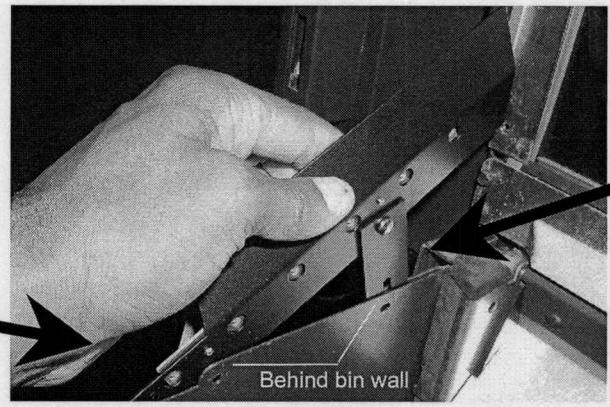


Figure 14.

17. Install National 148 Emitter Assembly using the 2 screws and 2 nuts provided. This assembly will include the smaller of the two sensor boards. It will mount to the outside edge of the bin. See Figure 15 for mounting orientation. See Figures 16 & 17 for correct completed assembly.

Emitter bracket should be on the outside of the bin wall when mounting.



Make sure the extension bracket is between the bin wall and brace.

Figure 15.

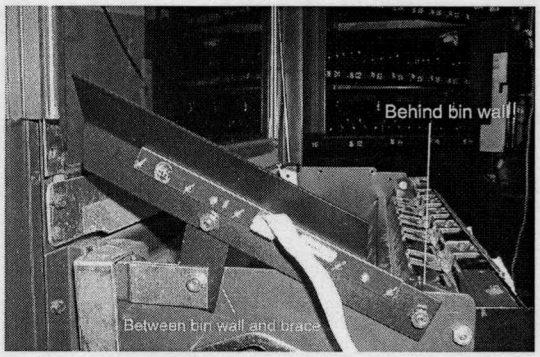


Figure 16.

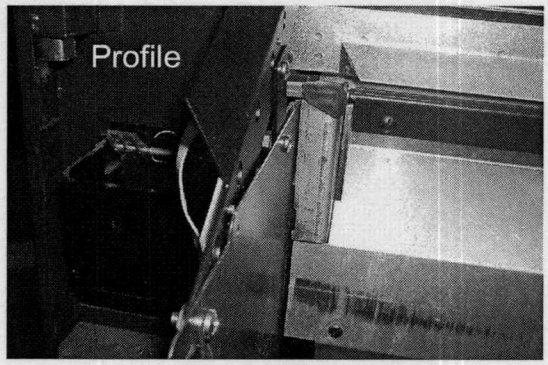


Figure 17.

18. Install National 148 Receiver Assembly using the 2 screws and 1 nut provided. This will mount on the hinge side of bin. See figures 18 & 19 for mounting orientation.

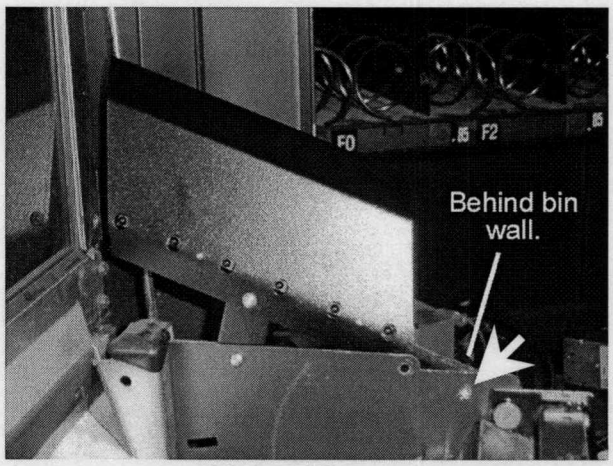


Figure 18.

Make sure the extension L-bracket is between the bin wall and brace.

Figure 19.

19. Route the cable along top side of gum/mint dispenser and along hinge side of bin as shown in figures 20 and 21.

Figure 20.

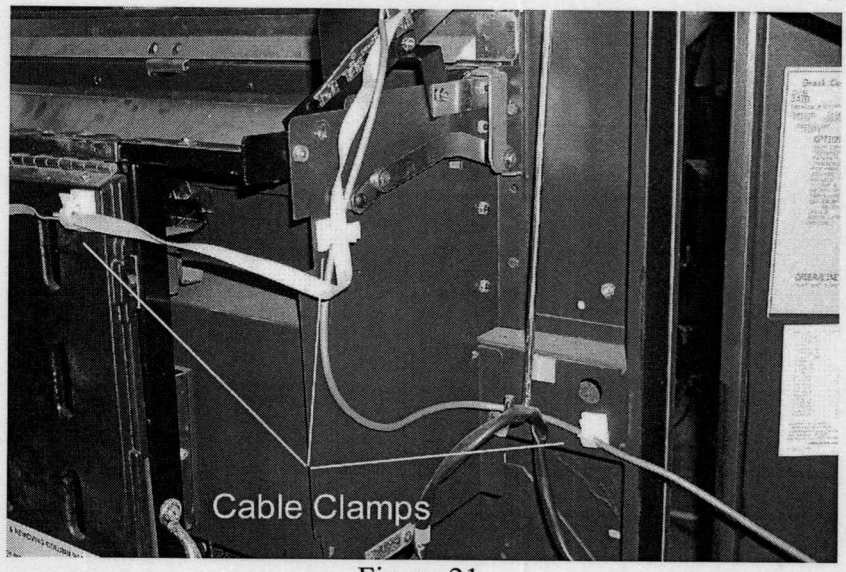


Figure 21.

20. The long sensor to VMC cable can plug directly into J19 of the VMC board. Make sure this cable is out of the way of the door's path so it can be closed completely.

21. DEX connection:
    - **J6 of Relay Board** – This will be connected to the panel-mounted connector on the front cover. Be careful when plugging this in. This should be the last connection you make on the board. Locate the front cover. There will be a cable extending from this cover with a 5 pin connector at its end. This will plug directly into J6. You may need to bend this cable towards the relay board. It will be a tight fit.

22. **J3, J6 and J14** will not be connected on the VMC.

23. After all of these connections are made, you can mount the cover onto the four standoffs using the screws available, (4) 08-0632-00. The cable extending from the jack mounted on the front cover may need to be bent upward to clear the

4.5 Set Motor Links (Space-to-Sales)

A Motor Link (also called Space-to-Sales) allows the VMC to distribute an identical product from several adjacent columns on the same row. Products are vended successively from each linked column, regardless of which column the customer actually entered.
VMC will prompt you for the tray, starting column number, and ending column number.

To clear a link, go to the Link Motors menu, move the cursor to the desired link, and press **Execute**.

4.6 Set Sales Blocking

Sales Blocking is used to disable vending based on the day of week and time of day. Typically, this feature is used for machines inside schools. Up to four periods can be defined. The periods can even overlap if required.

To enable blocking, select SALES BLOCKING on the Config Menu, then select one of the four available blocking periods. For each blocking period, you are able to set starting time, ending time, the days of the week for which blocking will be active, and the products which will be blocked. Press **Execute** to change a time, to toggle the status of a day, or to toggle the status of a product. When finished, exit with **Cancel**.

The blocking period menu also contains the selections BLOCK ALL ITEMS and EXEMPT ALL ITEMS. The former selection causes all products in the machine to become subject to the blocking period. The latter item causes all products to become exempted from the blocking period, effectively disabling the blocking period.

To deactivate a blocking period, go to the Sales Blocking menu, select the desired period, and toggle all days of the week to OFF. Alternately, the EXEMPT ALL ITEMS selection can be used.

Blocking periods are allowed to extend beyond midnight. In such cases, the VMC uses the day-of-week in effect at the start time to decide when the blocking period ends. For example, consider a blocking period enabled for Monday through Friday for 6:00 PM through 5:00 AM. On Saturday, vending will be disabled from midnight until 5:00 AM because the start time occurred on a Friday, and blocking was enabled on Fridays.

When you have completed all Sales Blocking changes, return to the Config Menu by pressing **Cancel**.

4.7 Set Prices

Exit the Config Menu by pressing **Cancel**. Scroll up to PRICE and select it.

The Price Menu allows you to set prices for the entire machine at once, on a tray-by-tray basis, or on an item-by-item basis. Make your selection, then enter the tray letter or selection number (if applicable). Now, you are able to key in the price directly. On machines with a "10" key, use that key to represent zero. You are not required to enter leading zeroes. Press **Execute** to save the price or **Cancel** to abandon it.

4.8 Check the Coin Mech

Exit the Price Menu by pressing **Cancel**. Scroll up to FILL / DISPENSE and select it.

This part of Service Mode temporarily enables the coin mech so you can add or remove a few coins using the front panel. If you haven't already done so, add a few coins to the mech. Then, press "1" to dispense the smallest-value tubed coin (such as the USA nickel), "2" to dispense the second smallest coin, and so on. If the coin mech responds to the dispense commands, and added coins are displayed at their proper value, then the connections to the coin mech are working properly.

4.9 Check DEX

If you use a DEX audit terminal, you can try it now. Note that the DEX connection is active at all times; you do not have to enter Service Mode to turn it on.

4.10 Set Options

These options are available under the Options Menu if needed for a particular installation. Use **Execute** to toggle the option where the cursor is located.

- **Force Vend**: disallows use of coin return button in most circumstances
- **Multi Vend**: does not return change automatically after a vend
- **Free Vend**: deliver all products in the machine for free
- **Change Bill**: allow patron to receive change for a bill without making a purchase
- **Motor Stop**: controls how the VMC knows when to stop a motor and deduct credit:

HOME	Motor stops after one revolution at the home position using a switch. Credit is deducted unconditionally.
DROP	Motor stops when a drop is seen, or after several revolutions. Credit is deducted only if a drop is seen. *(Drop Sensor option required.)*
BOTH	Motor stops after one revolution at the home position using a switch. Credit is deducted only if a drop is seen. *(Drop Sensor option required.)*

On Gum & Mint trays, the VMC automatically uses the home switch capability (if available) regardless of the Motor Stop setting. If the drop sensor is otherwise enabled, and machine conditions do not prohibit its use (see Section 2), then drop sensors will be used on Gum & Mint trays also.

- **Card Rdr**: controls how the Micromech connector is used:

MDB	Card reader uses MDB interface. The coin mech, if present, may be either Micromech or MDB. The coin mech type is detected automatically at power-up.
M-MECH	Card reader uses Micromech interface. The coin mech, if present, must be MDB.

- **Bill Val**: controls which type of bill validator is used:

MDB	Bill validator uses MDB interface.
PULSE	Bill validator uses low-level (DC voltage) credit pulse interface through a separate VMC connector. **NOTE: Non-MDB bill validators may need to be adjusted to work with the VMC; see Section 8 for details.**

- **Coin Lev Mem**: controls whether Micromech coin levels are remembered after power loss.

OFF *(default)*	Micromech coin tube levels are not remembered after power loss. Instead, the VMC uses the coin mech's low tube sensors to establish tube levels. This setting may cause the VMC to underestimate available change, restricting bill acceptance until change levels

	increase. For example, in USA applications where items are priced at more than $1, customers will not be able to insert two $1 bills in succession.
ON	Micromech coin tube levels are remembered after power loss. If coin cassettes or the coin mech itself are ever replaced, the VMC's coin [illegible] 2) Toggle this setting OFF and then back ON.

- **DEX Support** determines how the VMC communicates over the DEX port:

V6 *(default)*	Use EVA-DTS 6.0 communication and reporting conventions.
V5	Use EVA-DTS 5.0 communication and reporting conventions. Select this option only if your auditing system has problems communicating with the VMC under the "V6" setting.

5 Sales Mode

This section describes the typical operation of Sales Mode as well as some optional behaviors and features.

5.1 Typical Operation

Under normal circumstances, when the machine is idle, the Sales Mode display consists of the message "INSERT MONEY" optionally followed by the current time. When credit is inserted, the display shows the word "CREDIT" followed by the credit amount. If a selection is attempted without sufficient credit, the display shows the full price of the item.

Several other idle messages may be displayed under special circumstances:

- "USE EXACT CHANGE" alternates with "INSERT MONEY" when a low change condition is detected. Low change is defined as all coin tubes empty (if no bill validator is present) or less change than the smallest-value bill (if bill validator is present). This message can also appear at time of selection if the coin mech does not have the proper coins to pay back either the inserted credit or the change for the selection.

- "NO SALES UNTIL *hh:mm*" appears when the Sales Blocking feature has disabled vending for a product based on the day of week and time of day. If all products are being blocked, this message replaces "INSERT MONEY" for the duration of the block.

- "FREE VEND" appears in place of "INSERT MONEY" if the machine-wide Free Vend option is enabled.

If a severe coin mech or Drop Sensor problem develops, the VMC will display "OUT OF SERVICE" and disable all payment devices. See Section 7 for tips on troubleshooting these conditions.

5.2 Drop Sensor

If the optional Drop Sensor is enabled, the VMC is able to verify whether a product actually dropped during a vend. Just prior to each vend, the VMC checks whether the sensor path is clear. If it is not clear, the VMC displays the message "SENSOR BLOCKED, UNABLE TO VEND" and returns the customer's credit. (This situation is often caused by debris buildup inside the machine.)

If the sensor path is clear throughout the entire vend, the VMC displays the message "PLEASE MAKE ANOTHER CHOICE." On cash vends, the customer can then try a different selection or press

coin return to get their money back. On some card (cashless) vends, the customer's card is returned automatically, but the customer is free to re-insert it immediately.

5.3 Bill Validators and Exact Change

The VMC evaluates change conditions in the coin mech when deciding whether to enable or disable the bill validator. Essentially, the VMC looks ahead and predicts what would happen if the customer inserted the smallest-value bill right now. If there would not be enough change to vend any product in the machine, or if there would not be enough change to pay back the inserted bill, the bill validator will be disabled and an "EXACT CHANGE" message will be displayed.

If you are testing a bill validator, be sure that the coin mech has enough coins to equal the smallest-value bill – but never less than 10 coins in a tube – to allow the VMC to enable the validator.

5.4 Card Revaluation

Certain MDB card (cashless) readers are able to increase the value stored on a customer's payment medium (card, key, or button) under VMC control. The VMC detects and supports such readers automatically. The VMC supports two slightly different forms of revaluation, depending on whether the customer inserts cash or card first:

1. "Cash First" revaluation: If the customer inserts a card when there is a cash balance, the VMC attempts to transfer the cash balance to the card, up to the card's revaluation limit. Any excess cash balance is paid out in change. If the revaluation is successful, the message "CREDIT ADDED TO CARD" will appear. Otherwise, the card session is ended, causing a physical eject on some readers.

2. "Card First" revaluation: In this scenario, the customer inserts cash after a card has already been inserted. When the customer presses coin return, presses the reader's cancel button, or makes a vend selection, the VMC tries to transfer the cash balance to the card, up to the revaluation limit. Any excess cash balance is paid out in change. If the revaluation is successful, the message "CREDIT ADDED TO CARD" will appear. Otherwise, the card session is ended, causing a physical eject on some readers.

6 Servicing the Machine

This section highlights some VMC features that can make routine machine servicing easier.

6.1 Checking Coin Tube Levels

In Service Mode, choose FILL/DISPENSE at the Main Menu. Either insert a coin of each type through the coin slot, or press '1', '2', '3', and '4' to dispense a coin of each type. In either case, the display will show the number of available coins of that type.

If you need to remove a large number of coins, it is usually faster to do so directly at the coin mech. Many coin mechs offer a repeating dispense feature that is faster than requesting the same dispenses from the VMC. Note that DEX accountability will not be maintained for dispenses initiated from Micromech coin mechs.

6.2 Accounting

The Accounting Menu provides audit counters that are accessible to service personnel, yet are completely separate from DEX activity. "HISTORICAL VENDS" and "HISTORICAL VALUE" show the number and amount of paid vends over the lifetime of the VMC. "RESETTABLE VENDS" and

"RESETTABLE VALUE" are resettable versions of the same counters. Select the "CLEAR ALL" item when you wish to clear the resettable counters.

6.3 Manual Motor Testing

To test a motor without changing any of the accounting data, go to the Diag Menu and select "TEST MOTORS." You can test either a single motor or an entire tray at one time. Watch the display for any error messages that may appear.

If the Motor Stop mode is HOME or BOTH, each tested motor will turn one complete revolution to the home position. If the Motor Stop mode is DROP, each tested motor will run for about one-third of a second.

6.4 Automatic Motor Testing

Automatic scanning for motor problems takes place at two times: at door closure (for machines with door switches) and when leaving Service Mode. If no problems are seen, the VMC double-beeps and returns to Sales Mode. If problems are detected, the VMC enters Motor Status Mode.

In Motor Status Mode, the VMC progressively displays all failed motor designations in the machine. If all configured motors on a given tray have problems, only a tray designation is displayed. The only key entry permitted is **Execute**, which re-scans for motor problems. If the re-scan finds that all motor problems have been resolved, the VMC will double-beep and return to Sales Mode. If no door or keypad activity is detected within a short time, the VMC will emit five short beeps and return to Sales Mode.

Here is an example of a display sequence from Motor Status Mode:

```
*MOTOR ERROR(S)*        *MOTOR ERROR(S)*
CHECK TRAY A            TO RE-TEST: H
```

In this example, all configured motors on Tray A have failures. It is likely that the mating connectors on the rear of Tray A are not fully engaged. Once Tray A has been re-seated, the route driver may either press **H** to scan again, or simply re-close the door.

	seems to be missing.	
CR CARD ERROR	**Card Reader:** the payment media is defective.	This is an informational message; the problem may be limited to one particular payment medium.
CR COMM - MINOR CR COMM - MAJOR	**Card Reader:** an internal communications problem occurred within the reader. Problem is either recoverable ("MINOR") or non-recoverable ("MAJOR").	Repair or replace card reader.
CR INVALID CARD	**Card Reader:** payment media problem.	This is an informational message; the problem may be limited to one particular payment medium.
CR JAMMED CARD	**Card Reader:** payment media has jammed inside the reader.	Clear the jam.
CR READER FAIL	**Card Reader:** an unspecified problem developed within the reader; device is not presently functional.	Repair or replace card reader.
CR REFUND FAIL	**Card Reader:** funds could not be credited to the payment medium following a failed vend; funds were lost.	Determine if problem is limited to one particular payment medium. Repair or replace reader if problem affects more than one payment medium.
CR SERVICE SOON	**Card Reader:** reader device requires maintenance.	Perform maintenance as recommended by reader's manufacturer.
CR TAMPER	**Card Reader:** a security breach has been detected.	This is an informational message.
MOTOR ERROR(S)	**VMC:** a vend motor is missing, jammed, or has a defective home switch.	Press the **Execute** key to see a detailed list of motor problems. See Section 7.3 for more information.
STUCK KEY	**VMC:** a key has been depressed for an abnormally long time.	Repair or replace machine keypad.
SENSOR BLOCKED	**VMC:** Drop Sensor system was found to be blocked at machine power-up.	See Section 7.4 for more information.

7.2 Coin Mech Errors

As noted earlier, the VMC displays the "OUT OF SERVICE" message in Sales Mode when serious coin mech problems occur. To clear the error and bring the machine back in service, press the **Execute** key. If you do not address the original cause of the error, the coin mech may re-report the error, causing the machine to go out-of-service again.

On some machines, the MDB coin mech is connected to the VMC through an existing machine harness. In these situations, it is helpful to unmount the coin mech and plug it into the VMC board directly. By bypassing the machine harness, you can help determine whether the coin mech, the harness, or the VMC itself is at fault.

It's important to know the details about motor problems, because the VMC prohibits vending on defective motors. When you press the **Execute** key at a "MOTOR ERROR(S)" display, you are taken into a special Motor Errors menu that displays the status of each problem motor. The following three letters are used on the error reports:

- "M" indicates that a motor was present when the machine was configured, but was missing when last checked.
- "J" indicates that the motor drew an excessive amount of current, and is probably jammed.
- "H" indicates that the motor failed to re-home itself within a reasonable amount of time.

Execute acts slightly differently in the Motor Error menu than in the main Sys Error menu: it immediately re-tests the motor to see if the error condition still exists. If the error has been resolved, it will be removed from the menu. On the other hand, if the error persists, the entry on the Motor Error menu will remain. Once again, any motor appearing on this menu cannot be used for vending until the problem is resolved.

7.4 Sensor Errors

If the Motor Stop option is set to DROP or BOTH, the VMC checks for sensor blockages at each power-up. If the sensor is blocked, a "SENSOR BLOCKED" error is generated. The best way to troubleshoot this error (and other sensor-related problems) is to use the TEST DROP SENSOR function under the Diagnostics menu.

During a Drop Sensor test, the VMC indicates the blockage status of the sensor through both audio and visual cues. You will hear one beep for each momentary blockage (such as a product drop) or one beep per second for a sustained blockage. The audio cues can be silenced by pressing the **Execute** key. If there is no obvious blockage in the sensor path, check the physical alignment of the sensor boards to verify that each is perpendicular to the sides of the delivery bin.

One of the two sensor boards provides a red diagnostic light which may be helpful during testing. If the light is fully illuminated, the sensor path is clear. If the light is pulsing, blockages are being detected. If the light is not illuminated, the sensor board is either defective or not receiving power; check the cable connection between the VMC and the sensor board.

7.5 Other Types of Errors

The remaining error types (bill validator, card reader, and stuck-key) are simple notifications; you press the **Execute** key to acknowledge that you read them. If you don't acknowledge these errors, they will keep appearing until you do. These errors do not cause the machine to go out-of-service.

7.6 Machine History Logs

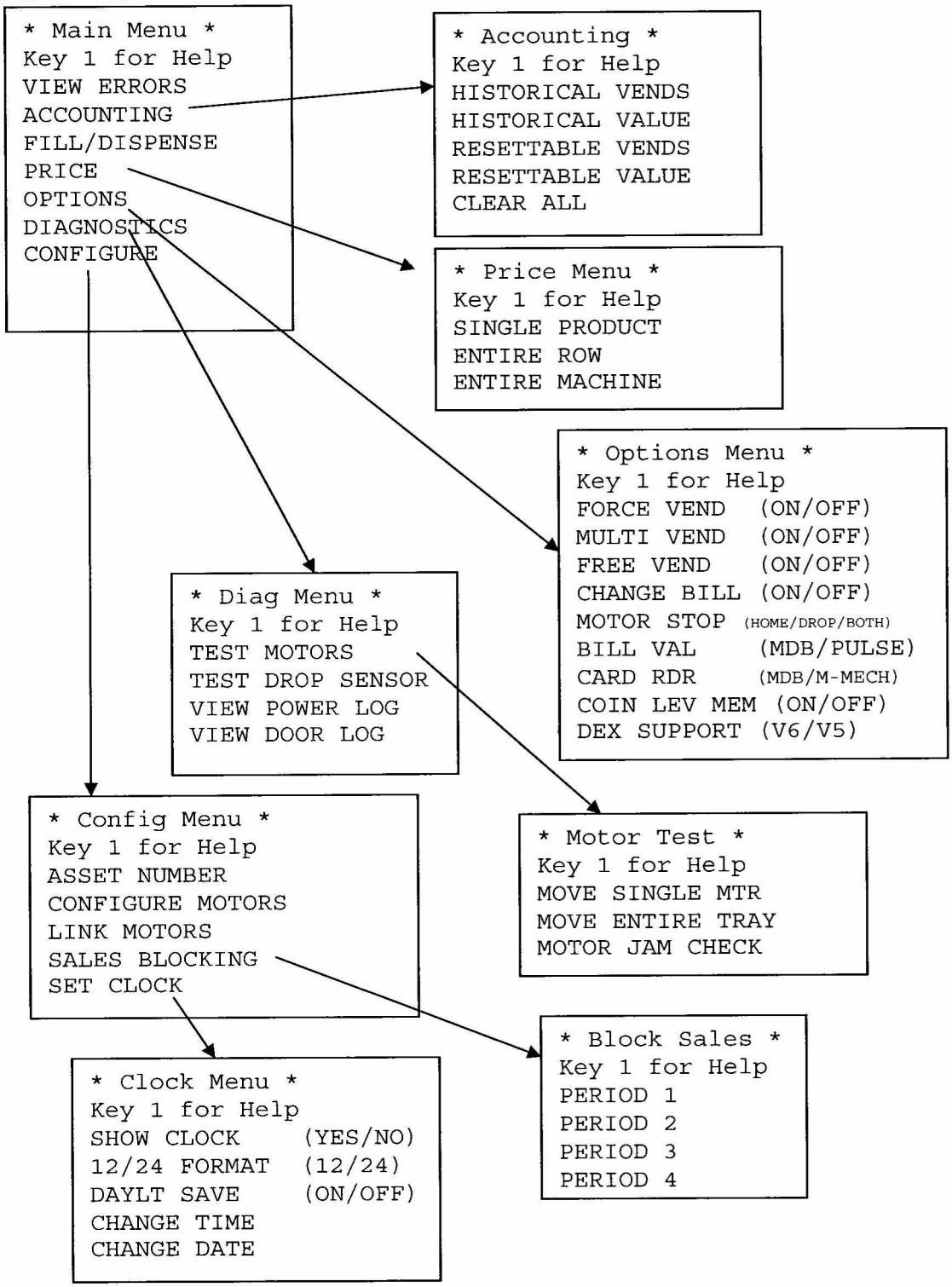
The VMC maintains a history of door and power events it has observed. To access these logs, go to the Diag Menu and select VIEW POWER LOG or VIEW DOOR LOG. In each case, the logs are shown starting from the most recent event and moving backwards in time, up to 10 events deep. Once the end of the log has been reached, scrolling down will cause the most recent event to be displayed again.

8 Pulse Bill Validator Settings

You may need to adjust DIP switch settings on pulse (non-MDB) bill validators, even if the validator was used with the vending machine's original control board. After adjusting DIP switches, you should cycle power on the machine. The following table lists switch settings for several popular types of bill validators. Settings marked in **bold** are required for proper operation.

Validator Model	DIP Switch Location	Settings
Mars/MEI VFM1	Underneath control box, which is screwed to the side of the validator.	#1: One direction (ON) or two direction (OFF) #2: Std. security (ON) or high security (OFF)
Mars/MEI VFM3	Underneath control box, which is screwed to the side of the validator.	#1: One direction (ON) or two direction (OFF) **#2: ON (short pulse)** **#3: OFF (1 pulse per dollar)** **#4: OFF (1 pulse per dollar)** #5: Std. security (ON) or high security (OFF) **#6: ON (relay output)** **#7: ON (high- or low-level pulse)** #8: $1 only (ON) or $1/$2/$5 (OFF)
Mars/MEI VN2300	Right side of validator.	#1/#2: Bill direction (1 OFF, 2 ON = 2-way) #3: High security (ON) or high accept. (OFF) **#4: ON (accept $1)** #5: $2 bill acceptance (ON=accept) #6-#8: Unused
Mars/MEI VN2500	Right side of validator.	#1/#2: Bill direction (1 ON, 2 ON = 4-way) #3: High security (ON) or high accept. (OFF) **#4: ON (accept $1)** #5/#6: $2/$5 bill acceptance (ON=accept) **#7: ON (short pulse)** **#8: OFF**
Mars/MEI AE2600	Right side of validator.	#1/#2: Bill direction (1 ON, 2 ON = 4-way) #3: High accept. (ON) or high security (OFF) #4/#5: $2/$20 Bill acceptance (OFF=accept) **#6: OFF (harness enabled)** **#7: OFF (short pulse)** **#8: ON (vending interfaces)**
Mars/MEI AE2800	Right side of validator.	#1/#2: Bill direction (1 ON, 2 ON = 4-way) #3: High accept. (ON) or high security (OFF) #4/#5: $50/$100 Bill acceptance (OFF=accept) **#6: OFF (harness enabled)** **#7: OFF (1 pulse per dollar)** **#8: ON (vending interfaces)**
Coinco BA30S	On control board; remove retaining screw and slide board out from its plastic case.	#1: High security (ON) or std. accept (OFF) #2: One direction (ON) or two direction (OFF) **#3: OFF (pulse interface)** #4-#7: $20/$10/$5/$2 acceptance (ON=accept) **#8: ON (accept $1)**

9 Service Mode Quick Reference



10 Revision History

17 October 2006: Firmware Revisions 2.60-2.61
- Improved motor error detection and display for route personnel.
- Added ability to block sales for selected products only (v2.61 firmware).
- Added card revaluation feature.
- Home switch usage now mandatory on all gum & mint trays.
- VMC disables Bill Validator if no change could be made for any product.
- Updated list of kits.

22 December 2005: Firmware Revisions 2.53-2.55
- Added required switch settings for pulse bill validators.
- Renamed items on Accounting menu to better reflect their function.
- Updated list of kits.

1 September 2005: Firmware Revision 2.52
- Updated list of kits.

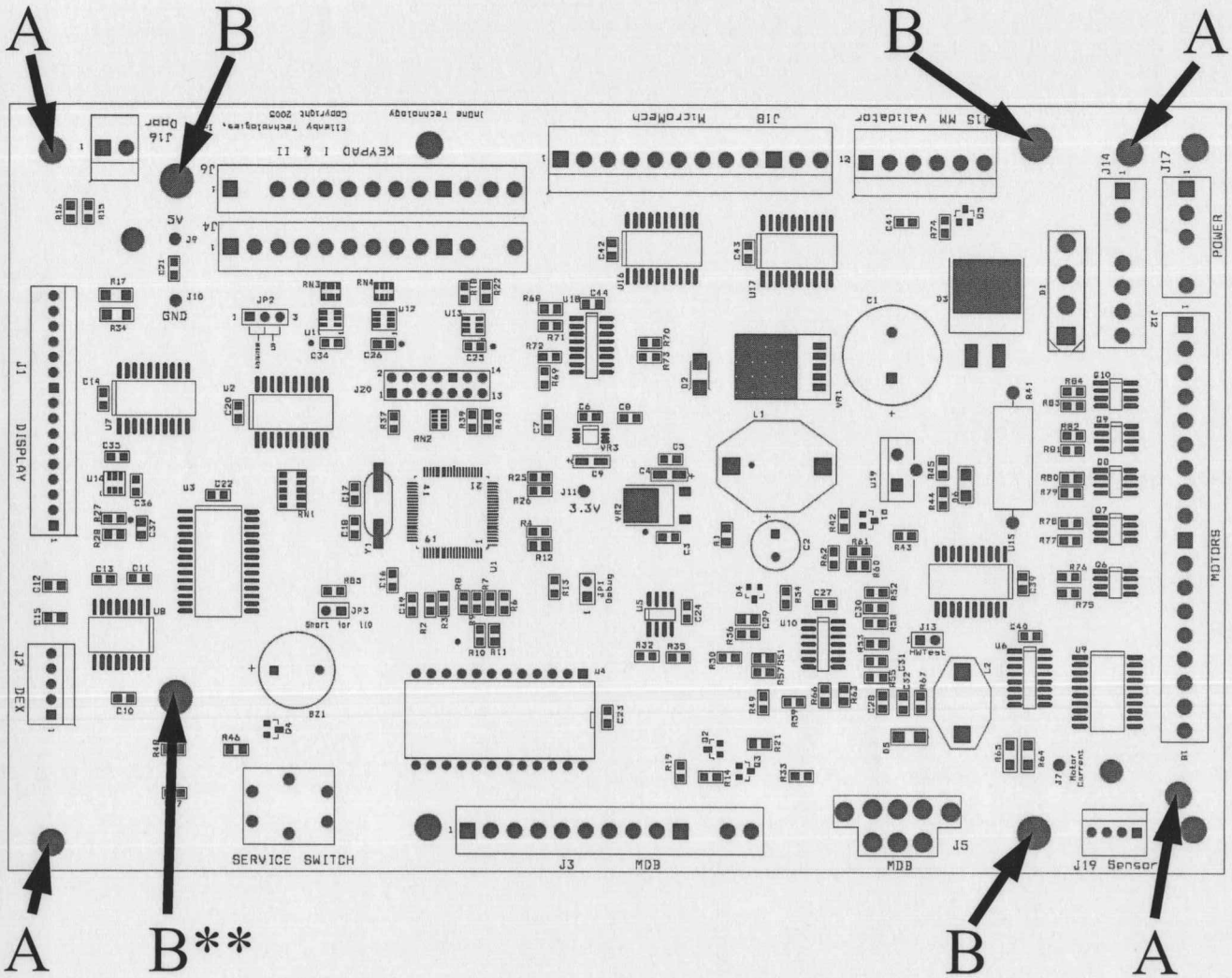
12 July 2005: Firmware Revisions 2.50 & 2.51
- Added Micromech, Pulse Bill, and DEX 6.0 capabilities.

9 May 2005: Firmware Revision 2.10
- First generic manual covering several kits.

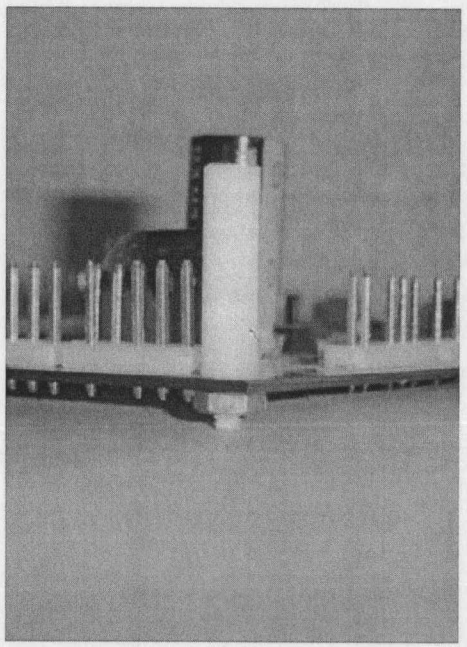
14 Feb 2005: Firmware Revision 2.01
- Rearranged sensor setup instructions.

09 Feb 2005: Firmware Revision 2.00
- Add Motor Stop option in place of Drop Sensor and Home Switch options.
- Add Change Bill option.
- Exact Change message now appears if all coin tubes are empty.
- Prepare for non-MDB payment device support.

VMC STANDOFF LOCATIONS



STANDOFF
CROSS SECTION
DETAIL



FOR AP 4000/5000 & AP 110 KITS PLACE STANDOFFS IN “A” LOCATIONS

FOR AP 6000/7000 & NATIONAL 147/148 KITS PLACE STANDOFFS IN “B” LOCATIONS

** THIS LOCATION REQUIRES A NYLON WASHER ON BACKSIDE

z:\prod process\standoff locations

Recommended
MDB Coin Mechs

24V transformer in machine may not provide enough power for dispensing on some coin mechs*

Coinco Quantum 700
Conlux CCM5G
MEI/Mars Series 4000
MEI/Mars Series 7000

***Micromech devices are not affected since they operate from 120V**