MERLIN III VENDER

4 Button Service & Parts Manual

Includes:
Major Parts Explanation, Vender Installation,
Programming, Troubleshooting Tips
and Exploded Part Views

ROYAL VENDORS®

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SAFETY SEGMENT

ROYAL VENDORS' COMMITMENT TO SAFETY

Royal Vendors is committed to safety with all of our product designs. We are committed to notifying the user of a possible danger involving the improper handling or maintenance of our venders. The servicing of any electrical or mechanical device involves **potential dangers**, both to those servicing the equipment and to users of the equipment. These dangers can occur because of improper maintenance or usage. The purpose of this safety segment is to alert everyone servicing Royal equipment of potentially dangerous areas, and to provide **basic safety guidelines** for proper upkeep.

The service manual contains various **warnings** that should be carefully read to minimize the risk of personal injury. This manual also contains service information to insure that proper methods are followed to avoid damaging the vender or making it unsafe. It is also important to understand these **warnings** provide general guidance only. Royal could not possibly know, evaluate, or advise of all of the conceivable ways in which service might be done. Consequently, Royal cannot predict all of the possible dangerous results. These outlined safety precautions are the basis for an effective safety program. Use these safety measures, along with the service bulletins, helpful hints and product specification sheets, when installing or servicing Royal equipment.

We recommend that persons servicing our equipment maintain a similar commitment to safety. **Only personnel properly trained should have access to the interior of the vender.** This will minimize the potential dangers that are inherent in electrical and mechanical devices. Royal has no control over the vender once it leaves the premises. It is the owner or lessor's responsibility to maintain the vender in a safe condition. See installation insert located in the coin box of a new vender for proper installation procedures and refer to the service manual for recommended maintenance procedures. If you have any questions, please contact the Technical Services Department at 1.800.931.9214.

SAFETY REGULATIONS

- Read the safety segment before installation or service
- Test for proper grounding before installing to reduce the risk of electrical shock and fire.
- Turn off or disconnect power cord from wall outlet before servicing.
- Only fully trained service technicians should service vender when vender has power.
- Remove any product before moving a vender
- Use appropriate equipment when moving a vender
- Always wear eye protection, and protect your hands, face, and body when working near the refrigeration system.
- Use only authorized replacement parts.
- Be aware of inherent dangers in rocking or tipping a vender

SECTION I: ELECTRICAL HAZARDS GENERAL ADVICE

Careless or improper handling of electrical circuits can result in injury or death. Anyone installing, repairing, loading, opening, or otherwise servicing a vender should be aware of this precaution. Apply all of the normal precautions when handling electrical circuits, such as:

- Refrigeration servicing to be performed by qualified personnel only.
- Unplug the vender before servicing
- Replace electrical cords if there is any evidence of fraying or other damage.
- Keep all protective covers and ground wires in place.
- Plug equipment into outlets that are properly grounded and polarized (where applicable), and protected with fuses or circuit breakers of the correct size.
- All electrical connections must be dry and free of moisture before applying power.

WARNING:
ALWAYS TEST TO VERIFY PROPER GROUNDING PRIOR TO INSTALLATION IN ORDER TO REDUCE THE RISK OF ELECTRICAL SHOCK AND FIRE

SECTION II: ELECTRICAL HAZARDS

A. Servicing with "Power Off"

For maximum safety, unplug the power cord from the wall outlet before opening the vender door. This will remove power from the equipment and avoid electrical hazards. Service personnel should remain aware of possible hazards from hot components although electrical power is off.

B. Servicing with "Power On"

Some service situations may require access with power on. Only fully qualified service technicians should perform power-on servicing. Particular caution is required in servicing assemblies that combine electrical power and mechanical movement. Sudden movement (to escape mechanical action) can result in contact with live circuits and vice versa. It is therefore important to maintain maximum clearances from both moving parts and live circuits when servicing.

WARNINGS:

1. ONLY FULLY TRAINED PERSONNEL SHOULD ACCOMPLISH "POWER-ON" SERVICING. SUCH SERVICE BY UNQUALIFIED INDIVIDUALS CAN BE DANGEROUS.

2. LIGHTING CIRCUITS CAN BE HAZARDOUS. ALWAYS DISCONNECT FROM POWER SUPPLY BEFORE REPLACING A BULB OR SERVICING THE VENDER IN THAT AREA.

3. NEVER USE A HOSE, PRESSURE WASHER OR ANY CLEANING METHOD THAT COULD WET ELECTRICAL COMPONENTS. SEE CLEANING SECTION OF MANUAL FOR SUGGESTED CLEANING METHODS. IF WATER CONTAMINATION OF ELECTRICAL COMPONENTS IS SUSPECTED, USE QUALIFIED ELECTRICAL TESTING EQUIPMENT AND TEST METHODS TO ASSURE THAT VENDER IS NOT A HAZARD BEFORE APPLYING POWER FOR ANY REASON.

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Chapter 1

General Information

Foreword

Thank you for the purchase of your "new" Royal Vendors "Merlin III" can / bottle vending machines. We are sure you will be pleased with them, as they are some of the most electronically advanced and reliable vendors in the marketplace today.

Over the past several years, Royal Vendors has been the industry's leader in the technological race to provide you with an electronically sophisticated, user friendly vendor coupled with low maintenance at a highly competitive price. We at Royal Vendors would like to thank all of you, our customers, for our success.

Introduction to "Merlin III"

The "Merlin III" RVCCE model vendor was designed to give you many features and options provided to you by the vendor's electronics. One feature is flexibility in pricing (multi-pricing), which will aid in accommodating a wide variety of packages. Another feature will allow "column to button" changes (space to sales), this feature will help to maximize the vendor's capacity. The Merlin III also contains a spectrum of other service and sales features such as "built-in" error code diagnostics and a "built-in" on/off timer just to name a few. The Merlin III vendor uses the same style main door, cabinet, and product delivery mechanism that has been used over the past several years.

Merlin III's electronic control board controls most of the vendor's functions including: pricing, column assignments and timer settings. Unlike vendors from the past, the control board controls the refrigeration unit by powering the refrigeration relay according to the pre-programmed cut in and cut out settings. The control board even has the capability to control the ballast (sign lighting) through an optional relay kit.

Merlin III's product delivery mechanism consists of the main product loading columns (a.k.a. stack assembly), oscillator (wide column) or rotor (narrow column), vend motor assembly and the delivery sensor. The vend motors drive the oscillator in a "back and forth" motion or rotor (capable of rotating 360°) to deliver product from the product loading columns. With a Merlin III vendor, the delivery sensor senses the impact of the product as it hits the delivery chute and signals to the control board to cancel credit and end vend cycle. Is that simple or what! The following pages will give helpful component information including troubleshooting for each component, set up information to program your "Merlin III" control board and at the end of the manual... More troubleshooting.

"Merlin III" Features

- Field proven, reliable vend mechanism and impact delivery sensor.
- With the patented learning mode, all vends are less than 2 seconds.
- User friendly 4 button programming (home, up, down, enter).
- Hand Held Computer (H.H.C.) programming/data retrieval (same as G-II).
- Single pricing or Multi-pricing per selection (determined by configurations mode).
- Real time clock/calendar to control "built in" timer (possible to display time of day).
- An optional key switch kit is available to allow free vending (every selection).
- An optional key switch kit is available to turn off selections chosen in the "StCl" menu.

- International language mode allows "**hold**" and "**sold out**" to be shown in English, French, Spanish, Hebrew or German languages (revisions 10.03 and higher only.).
- When a sold out is registered with one or more columns. The far right decimal point (bottom right hand corner) on the L.E.D. will light and stay lit until the vendors door is opened and closed. (10.05 and greater)
- The Merlin III vendor supports Multi-Drop Buss (M.D.B.) coin mechanisms and bill validators (revisions 10.02 and before will also support a 110 volt bill validator.).
- Multi-Drop Buss debit card reader capable (revision 10.03 and higher only.).
- Programmable space to sales allows you to program factory standard or custom settings.
- Capable of setting Full escrow to vend (even if a column jams)
- Capable of being set for 1, 2, or 3 deep (does not use vend timing cams)
- A settable password to access an external menu to gather can counts and errors.
- Coin payout is done through the select buttons (via the control board's "CPO" mode.).
- Exact tube fill/accountability by using the control board's "tUFL" mode. Coins are counted as they are inserted through the coin acceptor's inlet chute.
- Test vending is done without using coins or bills with the control board's "tESt" mode.
- Can and cash counters:
  - Historical (non-resettable) total can and cash counters.
  - Individual can and cash counters (choice of resettable or non resettable).
  - Possible to display Can & cash counts on the L.E.D. upon opening the main door. (10.05 and greater)
- Vendor errors are displayed on the L.E.D. display upon opening the vendor's main door. The control board's "Eror" menu gives "detailed error description" of each error.
- Programmable timer (7 day / 24 hr.) to allow:
  - Chosen selections to be turned off twice a day.
  - Refrigeration system to be turned off once a day.
  - Sign lights to be turned off once a day (requires an optional relay kit.).
- Merlin III's electronic refrigeration control features the following:
  - The refrigeration unit will immediately shut down upon door opening (to prevent evaporator frosting). The unit will restart after the door has been closed for 3 minutes . If the vendor's door switch is not activated after 30 minutes, the unit will automatically start (as in the case of a door switch failure.).
  - After a power failure, the unit will not start for 3 minutes.
  - Automatic defrost control: After 4 hours of continuous running, the refrigeration unit will automatically shutdown for 18 minutes to defrost.
  - No altitude adjustments are necessary (control capillary is eliminated)
  - The temperature can be displayed on the L.E.D. in either Fahrenheit or Celsius.
  - Temperature adjustments are made through controller programming.
    cut-in range: 39°f to 45°f (factory setting: 41°f)
    cut-out range: 24°f to 34°f (factory setting: 29°f)
  - An optional heater kit is available. (It works by sensing the internal cabinet temperature drop when the refrigeration system is not running.)
  - If a problem exists, the display will give you helpful "refrigeration error codes" upon opening the vendor's main door (refer to Chapter 5, Reading Error Codes)

Vendor Identification

Your Merlin III can/bottle vending machine can be easily identified by taking note of the vendor serial plate, refrigeration serial plate and the control board revision number. The information provided by these three types of identification are vital when contacting a Royal Vendors representative, when concerning a parts order (defined under the warranties section) or when seeking service advice:

VENDOR SERIAL PLATE: The external serial plate is mounted to the left side of the vendor's main door. This serial plate will give helpful information such as:

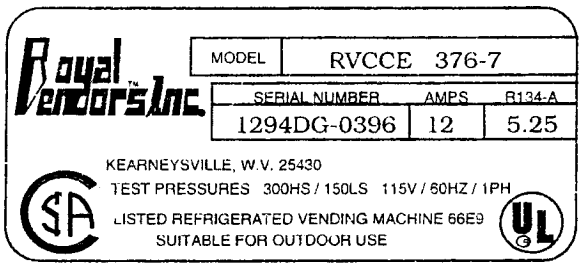
- Vendor model = RVCCE (**R**oyal **V**endors **C**oca **C**ola **E**lectronic)
- Vendor model number = 376-7 (12 oz. can capacity - # of selections)
- Cabinet serial number (specifies vendor production run number followed by the quarter of year letter designation, followed by the year letter designation. The last 4 digits of the serial number represent the number of the vendor during the production run. Example: 1294DG-0396).
- The serial plate will also specify the amount of amperage required, the amount of refrigerant used by the refrigeration system and the refrigeration pressures as tested.

- Production quarter (alpha. designations)

A = January, February, March
B = April, May, June
C = July, August, September
D = October, November, December

- Year of production (alpha. designations)

A = 1988 **E** = 1992
B = 1989 **F** = 1993
C = 1990 **G** = 1994
D = 1991 **H** = 1995

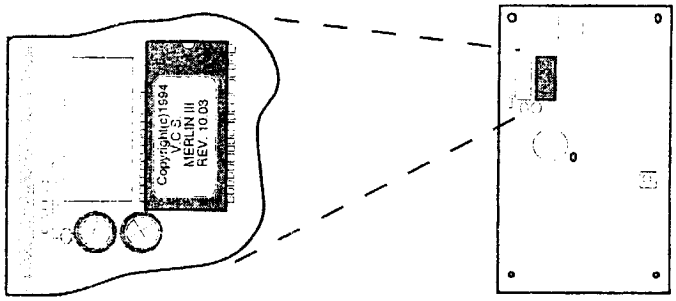


REFRIGERATION SERIAL PLATE: The refrigeration serial plate is mounted to the front of the refrigeration unit to the condenser shield. This serial plate will give the refrigeration model number (example: 300) and the refrigeration unit (vendor) serial number. Refrigeration unit sizes are as follows:

- Model 4000 = 1/4 horsepower, mostly used in narrow vendors (28" wide)
- Model 3000 = 1/3 horsepower, mostly used in 2 deep mid sized vendors
- Model 8000 = +1/3 horsepower, (a.k.a. super third) mostly in 3 deep vendors

The refrigeration serial plate offers the serial number of its original cabinet. It will also specify the amount of amps required and the amount of refrigerant used by the refrigeration system.

CONTROL BOARD REVISION NUMBER: The control board identification number is printed on a white decal located on the main chip of the control board. This identification number will consist of a version number followed by the revision level of that particular version (example: 10.02,10.03 or 10.04). This number will be used to ensure proper control board compatibility with the vendor and it will also be needed when trying to obtain vendor programming information.



Warranties (To the Original Purchaser)

We warrant the vend motors for five years and three months. The refrigeration system, consisting of the fan motors, compressor, evaporator, "clean-flo" condenser and the refrigerant tubing, we will warrant for five years and three months. Any unauthorized tampering with or cutting (tapping) into will void the warranty. The control board (controller) and the L.E.D. display are both warranted for three years. All other parts except for the light bulbs and finish are warranted for one year and three months.

Royal Vendors' obligation under warranty is limited to repairing or replacing the subject part at our option, when upon examination it was determined by Royal Vendors to be defective. Royal Vendors will pay shipping charges on all parts covered under this warranty when transportation has been made the most economical way.

The warranty is voided when a cabinet or any part thereof has been subject to misuse or alteration without proper authorization. Accident or damage caused by fire, flood, transportation, civil disorder, or act of God is not covered under warranty.

Credit and Replacement Policy

Credits or replacements will be issued on warranty items if the proper procedures are followed:

1. We require the vendor/unit serial number when placing a parts order, before parts can be sent as warranty items.
2. Please make sure that you have your complete name, company name, address and phone number on the packing slip.
3. Please send back the packing slip with a brief explanation and serial number for each item. Just as a serial number is required when placing a parts order. The same serial number is needed to properly credit your account upon the return of parts (must be written on a copy of the packing slip for each item).
4. If the item returned is no longer under warranty it will be sent back to you at your expense.
5. All warranty parts should be properly wrapped and packed securely to avoid further damage. Refrigeration units that are returned from the field and have been tapped into, tampered with or not packaged properly will void the warranty.
6. If not returned within 60 days, the invoice will be due in full.
7. Return material tags are provided for sending back warranty parts. Please fill out the tag completely, keeping the white copy for your records and sending the yellow tag back attached to the part.

Chapter 2

Vendor Component Explanation

Vendor Control Board

Your Merlin III vendor is equipped with a main control board which is responsible for all vendor operations. It is located in the upper section of the select panel inside the vendor's main door. The control board is protected by a metal cover. Removing this cover will expose the control board in it's entirety, along with all of the control board's connections.

Identification: The Merlin III control board can easily be identified by noting the identification number which is printed on a small white decal. The decal is located on the control board's main chip. The identification number listed on the decal consists of a version number followed by the revision level for that particular version. This control board identification number is a necessity when ordering parts for your vendor and when contacting a Royal Vendors representative for service help. (The control board ID number is shown in "Vendor Identification" in Chapter 1)

Operation Requirements: The control board requires approximately 24 volts AC from the low voltage transformer (described later in this chapter). This will allow the control board to supply power to all the vendor components which are listed below (with exception to the ballast/lighting system).

Operation: Upon receiving the appropriate voltage from the transformer, the control board will issue information to some components, receive information from some components and communicate both ways with some components.

- The control board issues instructions (and or voltage) to:
  - L.E.D. display
  - vend motor (Only when vend motor is to run)
  - refrigeration relay (Only when ref. unit is to run)
- The control board receives information (and or voltage) from:
  - select switches (logic level)
  - door switch (logic level)
  - delivery chute sensor
  - temperature sensor

Note: The control board will also supply logic level (extremely low voltage) signals to the select switches and door switch circuits. The control board will constantly monitor both circuits for any activity such as a sticking switch.

- The control board communicates both ways with:
  - coin mechanism
  - bill validator (optional)
  - hand held computer (optional)

The Merlin III control board is mainly composed of 14 electrical pinouts, a set-up mode button, a delivery sensor adjustment trimpot, a delivery sensor adjustment indicator lamp and various other electronic components, all of which are designated by position numbers. The following section outlines all the control board's pinouts by showing for each:

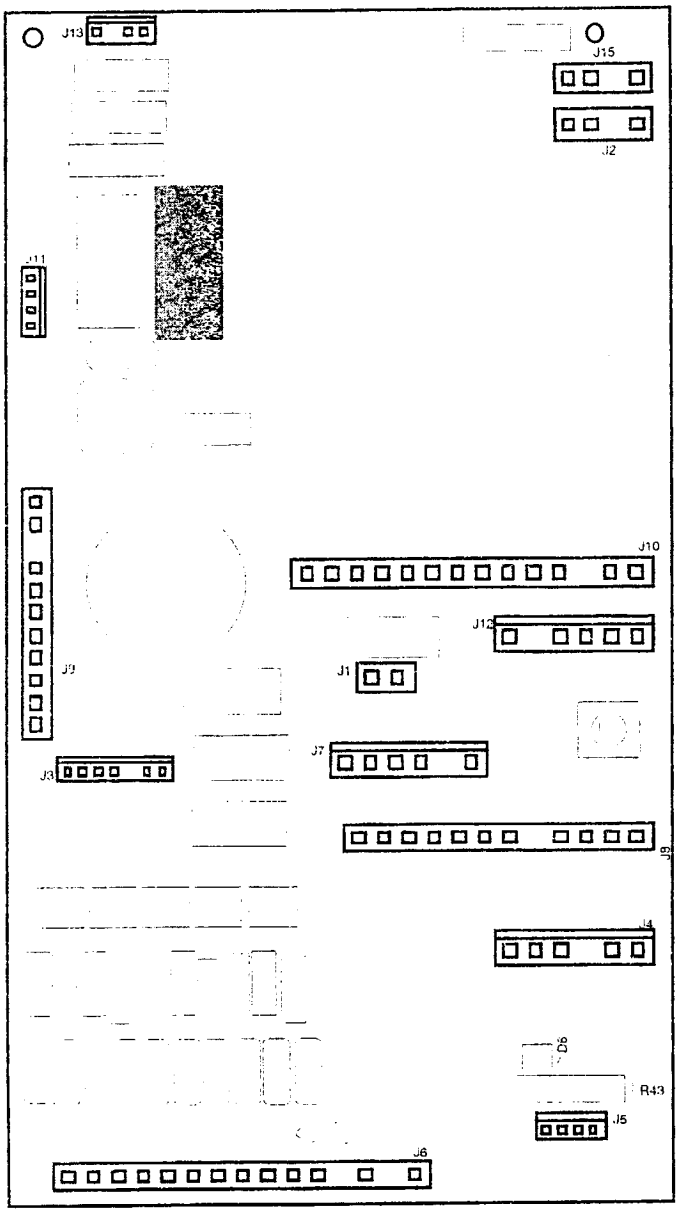
- The pinout position code as found on the control board (example: J1)
- The name/purpose of the pinout (example: 24 volt power connection)
- A paragraph describing in detail, the pinouts purpose and it's function.
- Following the paragraph will be a illustration of the pre-described controller pinout to show the order of the pins and the "keys" location if any.

Merlin III Control Board Pinouts

Notes:

1. The word "key" refers to the small plastic insert that is plugged into a position of the harnessing. The purpose of the "key" is to prevent someone from plugging the harnessing on backwards or upside-down. The "keyed position" is a blank position within the pinout (no pin) in which a "key" is inserted. Some pinouts may have several blank positions, with a key plugged in one or more of the positions.

2. Position 1 of the pinout will be indicated with the number one (1). You will find position 1 at one end of most pinout illustrations and also printed at the end of most pinouts on the control board. All pins, including the key, are numbered from pin 1 to the opposite end of the plug. The following pages will show each pinout identifying all connecting wires and the function of each.



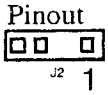
J1 (24 volt Power Connection): The 2 wire harness connecting to this pinout comes from the Low Voltage Transformer. It is imperative that the correct harness be connected to this pinout. If this harness is not connected or if power is lost to this connection, you will noticeably lose all vendor functions (except main door lighting) including power to your L.E.D. display and power to your coin mechanism (will not accept coins). With this connector, either wire can be in either position and the control board will not be affected. Position 1 is not listed

Pinout

Pin #	Wire #	Function
1	-	24 volt AC
2	-	neutral

J2 (Internal Dex / U.C.S. Connection): The 3 wire harness connecting to this pinout comes from the Hand Held Computer jack, which is located inside the vendor's main door, near the control board. The Hand Held Computer plugs into this jack to read and write information from the vendor's control board. If the H.H.C. is not operating properly, check this harness for bad connections at the solder joints and also check to ensure that the insulator is not cracked from over tightening.

Pinout



Pin #	Wire #	Function
1	red/white	transmit
2	key	-
3	white	receive
4	green/white	signal ground

J3 (Multi-Drop Buss Connection): The 6 wire "serial harness" that connects to this pinout provides power and communications to and from the control board for the coin mechanism, the optional 24 volt Bill Validator and/or the optional Debit Card Reader (revisions 10.03 and higher only). If this harness is cut, pinched or disconnected you will noticeably lose power to the coin mechanism and thus losing all coin acceptance and a "CHAr" error will occour.

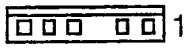
Note: If a 24 volt M.D.B. bill validator is in use it will be linked in with the coin mechanism and the control board by using a three connector "y" harness (which connects to the serial harness.).

Pinout

Pin #	Wire #	Function
1	white	+35 VDC
2	brown	ground
3	key	-
4	black	receive data in
5	red	transmit data out
6	green	ground
7	blue	no connection

J4 (Executive Coin Mechanism Connection): This connection is for international use. For wire numbers or other information please contact the coin changer's manufacturer.

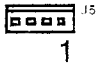
Pinout J4



Pin #	Wire #	Function
1	-	ground
2	-	tx+
3	-	key
4	-	tx-
5	-	rx+
6	-	rx-

J5 (Delivery Chute Sensor Connection): The 2 wire harness connecting to this pinout is a gray "shielded cable" harness. It should never be cut, pinched, or spliced (see "delivery chute sensor" in this chapter). This harness is formed into the "impact" sensor (which is mounted beneath the center of the delivery chute). It travels through the bottom of the vendor's main door to the control board.

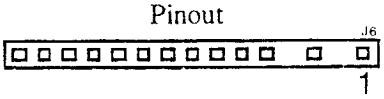
Pinout J5



Pin #	Wire #	Function
1	-	ground
2	red	sens. 2
3	black	sens. 1
4	-	ground

J6 (Vend Motor's Connection): The wiring harness connecting to this pinout is responsible for providing the control board with a "constant" 110 volts through wire EV36. The control board then transfers this power to an individual vend motor upon selection (via pins 1 through 10), for the duration of the vend cycle.

Pinout



Pin #	Wire #	Function	Pin #	Wire #	Function
1	green	ground	9	EV 4	vend motor #4
2	key	key	10	EV 5	vend motor #5
3	EV 38	neutral	11	EV 6	vend motor #6
4	key	key	12	EV 7	vend motor #7
5	EV 36	115 VAC	13	EV 8	vend motor #8
6	EV 1	vend motor #1	14	EV 9	vend motor #9
7	EV 2	vend motor #2	15	EV 10	vend motor #10
8	EV 3	vend motor #3			

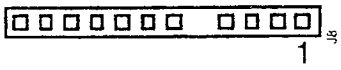
J7 (Option's Connection): The wiring harness connecting to this pinout travels from the vendor's door switch, through the bottom of the vendor's main door and to the control board. Pin out J7 is also used for the optional "free vend" and "no vend" key switch kits.

Pinout

Pin #	Wire #	Function
1	EV 50	ground
2	key	key
3	-	free vend option
4	-	no vend option
5	-	no connection
6	EV 51	door switch

J8 (Select Switch Connection): The wiring harness connecting to this pinout carries a logic level (ground) signal from pin 1 of the control board to the common position of each select switch. Upon activation, the select switch will allow the logic level signal to travel back to the control board. This will tell the control board that a particular switch is activated.

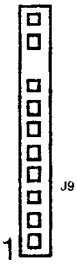
Pinout



Pin #	Wire #	Function	Pin #	Wire #	Function
1	EV 30	ground	7	EV 23	selection 05
2	EV 19	selection 01	8	EV 24	selection 06
3	EV 20	selection 02	9	EV 25	selection 07
4	EV 21	selection 03	10	EV 26	selection 08
5	key	no connection	11	EV 27	selection 09
6	EV 22	selection 04	12	EV 28	selection 10

J9 (110 volt Bill Validator Connection): Consult bill validator manufacturer for harness information including wire identification, drawings, etc.

Pinout



Pin #	Wire #	Function	Pin #	Wire #	Function
1	-	ground	7	-	no connection
2	-	bill in	8	-	ground
3	-	escrow rl	9	key	no connection
4	-	+ 5 VDC	10	-	r/ com
5	-	+ 5 VDC	11	-	r/no
6	-	1/5 enable			

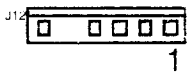
J11 (Display Connection): The 4 wire harness connecting to this pinout travels from the vendor's L.E.D. (digital display) to the control board. It allows the control board to send power to and communicate with the L.E.D. If this harness is cut or disconnected the L.E.D. will go blank. If this harness is pinched you may see "broken segments" on the L.E.D. with different segments of the display lit.

Pinout

Pin #	Wire #	Function
1	green	ground
2	yellow	data line
3	red	clock line
4	black	+5 volt DC

J12 (Relay Control Output Connection): The wiring harness connecting to this pinout powers the refrigeration relay (to power the refrigeration unit). It is also responsible for powering any optional relays, such as the refrigeration heater relay, evaporator fan relay and ballast (sign lighting) relay. It powers all relays by providing a constant 24 volts DC to each relay from pin 1. When the relay is to be turned on, the control board will then provide neutral for each relay from either pin 2, 3, 4 or 6

Pinout



Pin #	Wire #	Function
1	ZX 1	+ 24 volt DC
2	ZX 5	heater output (opt)
3	ZX 3	compressor
4	ZX 4	evap. fan output (opt)
5	key	no connection
6	ZX 6	light output (opt)

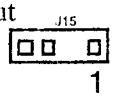
J13 (Temperature Sensor Connection): The wiring harness that is connected to this pinout travels from the Temperature Sensor to the control board. The Temperature Sensor is mounted on the rear tank above the evaporator fan. This harness is molded into the temperature sensor and should never be cut, pinched or spliced back together if cut. If the harness is cut or pinched the sensor may give the control board false temperature readings.

Pinout

Pin #	Wire #	Function
1	red	+5 volt DC
2	white	temperature
3	key	no connection
4	green	ground

J15 (External Dex / U.C.S. Connection): The 3 wire harness connecting to this pinout comes from the external hand held computer jack which is located on top of the welded port assembly. The hand held computer (H.H.C.) plugs directly into this jack to read information from and write information to the vendor's control board. If the H.H.C. does not operate properly, check the harness for bad connections at the solder joints and also check to ensure that the insulator (at the jack) is not cracked from over tightening.

Pinout



Pin #	Wire #	Function
1	red/white	transmit
2	key	no connection
3	white	receive
4	green/white	signal ground

L.E.D. (Digital Display)

Your Merlin III vendor is equipped with a low voltage L.E.D. display that receives voltage/information from the control board. The L.E.D. is a very important communication link between the vendor and the customer or operator.

Identification: The L.E.D. display, which is an electronic component, consists of a four digit display, a correct change indicator lamp and a sold out indicator lamp. The L.E.D. snaps into place on the inside of the vendor's main door above the t-handle assembly (in the coin insert).

Operation Requirements: The L.E.D. display must receive 5 volts DC for it to operate properly. This voltage can be read with a voltage meter between pin 4 (+5 VDC) and pin 1 (ground). If nothing is read, then read between pin 4 (+5 VDC) and chassis (door) ground.

Operation: In the sales mode (main door closed) the L.E.D. is used to display a greeting (ie: ICE COLD COCA COLA), credit information and sold-out information. In addition, it is optional in the sales mode to display the vend price, the time of the day, the temperature in either Fahrenheit or Celsius and a "USE COIN ONLY" message if there is not sufficient coins in the coin mechanism for payback. During the service mode (vendor's main door is open), the display gives the operator the capability to manually set the vendor up (without using the H.H.C.). Upon opening the vendor's main door the display will give the operator helpful error codes and sales and cash counters (10.05+ optional through configuration mode).

Since it is possible for the vendor to function without the L.E.D. (as in a case of vandalism), it is recommended that price decals be used to indicate to the customer the vend price.

Testing: If upon arriving at a vendor you notice that the L.E.D. display is not lit, first check to ensure that the vendor is plugged in. Try powering the vendor down and back up. Try pressing the control board's "mode button" and check all connections and wiring.

1. The first step is to check the coin mechanism, to see if it will accept coins (It will route the coins to the coin mech. tubes or the vendor's cash box.). If so, try to vend a product. If it vends fine, more than likely the L.E.D. display or the L.E.D. lead is bad.

2. If the coin mechanism does not accept coins. The next step is to make sure that the control board has the ability to power the L.E.D. by checking the transformer. Check voltage at the vendor's "2 way" 24 volt AC power connection position "J1" on the vendor's controller.

You should read approximately 24 volts AC. If not, then check the vendor's transformer (as described under "Low Voltage Transformer" in this chapter).

3. If 24 volts AC is registered during step two, then you want to measure voltage at position "J 11" across pins 1 and 4 of the control board on the rear of the L.E.D. lead (with the L.E.D. lead attached to the pinout to ensure a proper connection is made). You should read approximately 5 volts DC. If approximately 5 volts DC voltage is not registered... Remove the L.E.D. lead and measure the voltage directly from the control board's pins 1 and 4. If the appropriate voltage is still not read... Replace the control board.

4. If approximately 5 volts DC is registered. Check the voltage at the other end of the L.E.D. Lead (where it connects to the L.E.D. Display) in the same fashion as above... If appropriate voltage is not registered, replace L.E.D. Lead... If voltage is correct, replace L.E.D. Display

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Low Voltage Transformer

The Merlin III uses a low voltage (75 VA) transformer which reduces conventional voltage to power the vendor's control board. The transformer is a major contributor to the vendor's operation.

Identification: The transformer is located on the inside of the vendor's main door above the lighting ballast (in the lighted section of the main door). To expose the transformer you must remove the transformer cover by loosening the 2 Phillips head sems screws. (Always replace the transformer cover when done). The transformer is black in color with a light colored plastic cover on each side to cover the transformer's windings and internal fuse.

Operation Requirements: The Transformer operates by receiving 110 volts AC from the vendor (Wires EV17 and EV18). It transforms the 110 volts AC into 24 volts AC which is what the control board requires for its operation.

Operation: The transformer has a 3 1/2 amp internal fuse on the secondary circuit to protect the control board and the coin mechanism. If the transformer fuse would blow, you would lose power to the control board, noticeably losing power to the L.E.D. Display and also losing power to the coin mechanism (coin mechanism will not accept coins and bill validator will not pull in a bill). If you have a problem similar to this, follow the procedures listed below.

Testing: Make sure vendor is plugged in.

1. The first step to checking the transformer is: Check the power going into the transformer at connected wires EV41 and EV17 (should be hot) and at connected wires EV40 and EV18 (should be neutral). You should register 110 volts AC... If not, then you need to check all wiring leading up to this point from the bottom of the vendor's main door... The transformer may not be the problem.

2. If 110 volts is registered during step one, then you want to measure voltage at the other end of the transformer: The 2 pin connector at the control board connected to position "J1". You should register approximately 24 volts AC at this end of the harness. If so, Check the control board... The transformer is good.

3. If 110 volts is registered during step one and 24 volts AC is not registered during step two... Unplug the vendor. Next, unplug the transformer connections at the transformer (110 volt side), at the control board (24 volt side) and remove the transformer from the vendor's main door. Locate the side of the transformer that has 2 "built-in" wires attached to it. Remove the plastic cover to expose the fuse and check it for visual damage. Then check for continuity across the fuse with a voltage meter or similar device. If the fuse is found to be bad you may replace it by soldering on a new one or replace the transformer in it's entirety.

Delivery Chute Sensor (and adjustment)

The Merlin III vendor is equipped with a delivery chute sensor which is responsible for reporting to the control board the impact of product on the delivery chute during a vend cycle. This will allow the control board to cancel credit and terminate power to the vend motor to end the cycle.

Identification: The sensor is centrally located beneath the delivery chute (tray) with two 1/8" aluminum pop rivets. It has a "built in" harness that travels from the sensor through the bottom of the vendor's main door and up to the vendor's control board. At the control board, it connects to position "J5" (lower right corner of the board).

Operation Requirements: The delivery chute sensor is different from other components, its only requirement from the vendor is that it be plugged in. The delivery chute sensor consists of a coil which generates a small signal upon impact. The control board is responsible for adjusting the sensitivity of how the signal is registered (by using the trimpot).

Operation: The delivery chute sensor is responsible for sensing the impact of the vended product and reporting it to the control board immediately upon impact. The "sensor adjustment indicator lamp" (position "D6", located above the sensor harness connection on the control board), can be used to visually judge the delivery chute sensors sensitivity either during a "stand-by" condition or during a vend cycle as long as the control board is powered with 24 volts from the transformer. The Indicator Lamp should not be lit during "stand-by". It should quickly blink upon impact of the delivery chute whether in "stand-by" or during a vend. This indicates that the delivery sensor is properly adjusted, and that it is communicating to the control board that it has detected impact. If the indicator lamp does not light, impact was not detected. If the Indicator lamp is constantly lit, or fades on and off frequently the delivery chute sensor is detecting noise or vibration from the vendor.

Adjustment and Fine Tuning

Located above the "J5" sensor connection is the "R43" sensor adjustment "trimpot", which includes an adjustment screw. This "trimpot" is used to adjust and fine tune the sensor. It is capable of turning both clockwise and counter-clockwise.

Located directly above the sensor adjustment "trimpot" is the "D6" sensor adjustment L.E.D. indicator lamp. The indicator lamp is mainly used to aid in adjusting the sensor but can also be used to test the sensor during product impact.

FACTORY SETTING (turn the adjustment screw as follows):

- Clockwise until the indicator lamp comes on.
- Counter-clockwise until the indicator lamp barely goes out.
- Continue to turn counter-clockwise 2 full turns.

FOR FINE TUNING:

- Multiple Vending: First make sure that the sensor is adjusted properly according to factory setting directions. Next, turn the sensor adjustment screw clockwise 1/4 turn to increase sensitivity... Test vend from each column.
- Dry vending: First make sure that the sensor is adjusted properly according to factory setting directions. Next turn the sensor adjustment screw counter-clockwise 1/4 turn to decrease sensitivity... Test vend from each column.

Testing: First make sure the vendor is plugged in and that the controller has power. (the L.E.D. will be lit, the coin mechanism will accept coins, The sensor indicator lamp will light upon impact on the delivery chute... lightly tap the chute with a tool or your fist to simulate a can drop)

1. Locate the sensor adjustment indicator lamp on the lower right corner of the vendor's control board. Under normal conditions (as in stand-by) the lamp should be off.
2. First test the sensor by hitting the center of the delivery chute while watching the control boards sensor adjustment indicator lamp. The light should blink solidly upon impact. If

not, turn the sensor adjustment screw clockwise in 1/4 turn increments (to increase the sensitivity) and test after each turn... If the indicator lamp still does not light, turn the adjustment screw clockwise for many turns... If the indicator lamp does not light, change the sensor (assuming that the control board has power and is working).

3. If the sensor adjustment indicator lamp lights properly during step two, Change the control board.

Vendor Door Switch

The vendor door switch is mounted to the lower right edge of the vendor's cooling compartment (under the vend mechanism). It is responsible for reporting to the control board when the door is opened (service mode) and when it's closed (sales mode). The door switch has a few other responsibilities which are listed below.

The vendor door switch is responsible for and should do the following:

- Resets any previous sold-outs
- Activates sales and service modes
- Sequences L.E.D. display to test segments upon door closure
- Resets credit back to zero
- After programming, it will allow you to enter the sales mode and will lock in most changes (except price changes) made during programming.

Identification: The vendor door switch is white in color and is a "three pole switch" (has three positions, common, normally open and normally closed). The door switch has a "two-wire" harness which connects it to the option's connection (position "J7") of the vendor's control board.

Operation Requirements: The vendor door switch requires a low level (ground) signal from the control board (common position). Upon activation, the door switch will return the low level signal to the control board. This will allow the control board to constantly monitor the door switch, thus acknowledging the doors condition; either opened or closed.

Operation: Wire E50 travels from pin #1 of the options connection ("J7") of the vendor's control board to the common position of the vendor door switch. This wire is responsible for carrying the ground signal to the switch.

When the door is opened, the door switch pops out. The signal travels from the common position through the door switch, out of the normally closed position and through wire E51 back to the option's connection of the control board. This produces the "service mode". The same may be achieved by removing the two wires from the door switch and connecting them together. During the "service mode" the display will show any vendor error codes, if no errors are present, the display will show "none" and then revert to a greeting.

With the vendor's main door is closed, the signal will travel through the Door Switch from the common position, out of the normally open position (where there is not a wire currently connected). This breaks the circuit to the control board to produce the "sales mode". This mode can also be achieved by removing one (or both) of the wires from the switch and leaving them disconnected. During the "sales mode" the L.E.D. display will show a greeting and possibly various other optional information.

Testing: Make sure vendor's main door is closed and that the vendor is plugged in. Make sure that there is power to the control board (L.E.D. is lit and the changer will accept coins).

1. First, take note of the L.E.D. display and what it is showing with the door closed. At this time you should be seeing a greeting (example: ICE COLD COCA COLA) and/or possibly the price, time, temperature or "Use Coin Only"... Open the vendor's main door and take note of what the L.E.D. display shows. It should either show any error codes (see Chapter

five, Reading Error Codes) or it should flash "none" and then go into its greeting (and all optional information to be shown in the "sales mode").

2. If the Sales and Service displays are just the opposite... Check the wire connections at the door switch (wire E51 may be on the normally open position instead of the normally closed position) and at the control board (verify with wiring diagram).

3. If the L.E.D. display doesn't change upon opening/closing the vendor's main door... Remove the two wires from the door switch, the display should go into a service mode, short them together to simulate a sales mode. If this works, replace the door switch.

4. If the L.E.D. display still does not change after step two, Wires E50 and E51 may be either shorted together (causing a constant sales mode) or cut (causing a constant service mode) somewhere between the door switch and the control board... If no problems are found, the control board may be at fault.

Coin Mechanism (Changer)

Your Merlin III vendor comes equipped with/ready for a 24 volt "Multi-Drop Buss" (also known as "M.D.B.") coin mechanism, which is mounted to the changer access door with three Phillips head sems screws.

Identification: "Multi-Drop Buss" is the connection of one or more devices such as a coin mechanism, bill validator, debit card reader, etc. through one central communication link to the controller. This type of communication provides more information, in the form of coin mechanism and bill validator error codes. With Merlin III, the line of communication is a serial changer harness, which is connected to position "J3" of the vendor's control board.

Operation Requirements: The control board provides the coin mechanism with a nominal 34 volts DC from pin #1 of the Multi-Drop Buss connection ("J3"). Pin #2 of this connection is the 34 VDC return (ground).

Operation: The coin mechanism determines the validity and value of each coin that is inserted into the vendor and sends the coin information to the vendor's control board. The coin mechanism also continuously informs the controller of the level of the coins that are in the coin tubes to be used for change. All change tube status and credit information is accumulated in the vendor's control board. At this point, the vendor's control board is responsible for lighting the correct change indicator lamp in the case that the changer does not have change to payback, if the coin mechanism is disconnected, or if the changer harness is cut or disconnected.

With the Merlin III vendor, the prices are set through the vendor's control board via programming, not through the changer. The control board is also in charge of initiating coin payout. Change is paid out through the three D.C. operated solenoid slides when payback is required. Coin payout can also be done by using the control board's "CPO" mode. If further coin mechanism information is required, refer to your separate operation and service manual for your type of coin mechanism or contact your local coin mechanism representative.

Testing: If the coin mechanism doesn't accept coins... Make sure the vendor is plugged in and that the L.E.D. display is lit. If not, the coin mechanism may not be the problem.

1. Check the power indicator lamp located beneath the coin acceptor (near the changer setting switches). If it is on, replace the coin mechanism.

2. If the coin mechanism power indicator lamp is off... Check all the harnessing between the coin mechanism and the control board for continuity and bad/wrong connections. If continuity and connections are good... The vendor's control board may be bad.

Vend Motors

Your Merlin III vendor is equipped with a vend motor assembly for each individual column. There are two different types of vend motors that may be used in your vendor, a wide column motor and a narrow column motor. These motors are not interchangeable. Both types do not use vend timing cams nor switches (as "electro-mechanical" vendor's do). It is the job of the delivery chute sensor to signal the control board, upon product impact, to cancel credit and end the vend cycle.

Identification: The vend motors are attached to the front of the "stack mechanism" and are located beneath the vend motor cover inside the vendor's cabinet. To access the vend motors you must first loosen the 5/16 hex head (also standard screwdriver slot) screw under the motor cover. After doing this, grip the motor cover from each side, Pull the cover out, then lift up to remove it. This will completely expose each motor.

• Wide Column Vend Motor: A wide column motor assembly can be determined by noting the linkage arm which is mounted to the rear of the vend motor. The wide column vend motor's linkage arm is used to drive the column's oscillator (a.k.a. "bail") in a side to side motion to deliver product.

• Narrow Column Vend Motor: This vend motor assembly can be identified by locating the vend motor's drive shaft on the rear of the vend motor. The vend motor's drive shaft has a pin through it which connects the vend motor to the "rotor" (a.k.a. "cup"). Upon selection, the vend motor will rotate the "rotor" clockwise to vend a product. The rotor is capable of turning 360° in a circular motion.

Vend Motor Part Number	Vend Motor Application
010,770,004	Narrow columns / 2 & 3 deep vendor's
010,780,004	Wide columns / 2 & 3 deep vendor's
058,950,004	Narrow columns / 79" 3 deep vendor's
058,940,004	Wide columns / 79" 3 deep vendor's

Operation Requirements: All four types of vend motors require neutral from the cabinet wiring harness and 110 volts AC from the control board at the time of operation.

Operation: The vend motor circuit refers to the complete "power" circuit which allows a vend motor to operate upon customer selection. *The circuit can be broken down into two sides: the 110 volt side (commonly called the "HOT" side) and the neutral side.* Both sides are needed for vend motor operation. Therefore, if either side is broken before reaching a vend motor, that particular vend motor (or all motors) will not operate.

Hint: Use the wiring diagram in the rear of this manual as a visual aid when going through this next section.

The vend motor circuit starts as power enters the vendor from the wall outlet and travels into the vendor's main wiring harness which is located in the lower section of the vendor's cabinet *(this will be shown on the lower right corner of the wiring diagram).* From here, the main wiring harness supplies power to various different components, one of which is the E.M.I. line filter *(shown to the left of the main wiring harness on the wiring diagram).*

The "filter", will power the vendor's main door and cabinet with the power first traveling through the "door/stack plug" (disconnecting this will kill all power to the vendor's main door and the vendor's cabinet/stack.).

From this point, the power branches out into the door and cabinet, carrying "hot" (shown on diagram as L1) and neutral (shown as N) to each. These 2 wires will turn into wires "E120" (hot) and "E-N" (neutral) before going into the 15 way connection at the bottom of the vendor's main door.

• Neutral Side (Sold Out switch panel): The neutral side splits at the 15 way plug (bottom of the vendor's main door). It travels upward into the vendor's main door as wire "EV18" (for various components) and into the vendor's cabinet as wire "E110", where it must first travel through the sold out switch panel before reaching the vend motors. This will ensure that a certain level of product is held in "pre-cool". In your vendor, the sold out switch panel is located above the vend motor cover. To remove the sold out cover, pull upward on it's top flange and out.

In your vendor, as the neutral enters the sold out switch panel at the common position of the extreme left sold out switch (shown on diagram at sold out switch 10 as wire E110), it travels to the right, applying neutral using a jumper wire. to the common position of each sold-out switch (one per column). If enough product is loaded in a column to depress it's sold out paddle, the top of the paddle will release the switch for this column, closing the switch's contact between the common and normally closed positions. This sold out switch will apply neutral from the normally closed position, to the motor for this column.

• 110 volt "HOT" Side (Control Board): 110 volts (and neutral) travels from the vendor's door/stack plug to the 15 way connector at the bottom of the vendor's main door. At this point, on the door side, the 110 volt "hot" wire is identified as wire number EV17 and the neutral wire is identified as wire EV18.

From the bottom of the vendor's main door, wires EV17 and EV18 travel upward into the main door to provide power to various connections (wires EV17B and EV18B are spliced into EV17 and EV18 at the bottom of the main door to carry power to the ballast for lighting.)

Wires EV17 and EV18 connect to the transformer. From the transformer, wires EV41 and EV40 carry 110 volts to the vendor's 2 way "mate-n-lok" socket connection to provide a power connector for the optional validator (In some cases a 24 volt validator will be used; if so this socket will be left unoccupied.)...

From the 2-way "mate-n-lok" validator connection, wires EV36 (110v.) and EV38 (neutral) carry power to the lower left connection of the vendor's controller, with an "in-line" fuse box installed on wire 36 (The purpose of the fuse box is to protect the control board and the vend motors from shorting one another out.).

Hint: If the L.E.D. Display does not register "Hold" after a selection the problem more than likely is not the vend motor circuit.

Since the vend motors receive all power from the control board you must go through the control board to test the motors (unless a 110 volt test lead is used). The motors can be tested in the normal sales mode, as with coins. The motors can also be tested without coins or bills in the "tESt" mode (refer to Chapter 3 "Controller Programming" for instructions)

Test number 1: If upon selection, the display registers "hold" followed by "sold out" (all selections), none of the motors run or energize.

1. Make sure vendor is plugged in and that product is pressing down the sold out paddle for that column.

2. First check the vend motors fuse (located in the black fuse box mounted in the changer plug bracket). If the fuse is good, check voltage/proper positioning of wire EV36 at pinout "J6" (motor connection) on the lower left corner of the vendor's control board... You should register 110 volts AC. If not, check for a short or cut in all wiring connected to wire EV36.

3. If 110 volts AC is registered on wire EV36 during step one and if it is properly positioned, check the neutral line between the door/stack plug and the common position of the left most sold out switch for shorts or cuts... If none are found, the control board may be at fault.

Test number 2: If upon selection, the display registers "hold" followed by "sold out" (one or more but not all selections). Some, but not all motors do not run or energize.

1. Make sure vendor is plugged in and that product is pressing down the sold out paddle for the column to be tested.

2. First check the wiring for continuity or bad connections between the control board and the "problem" motor... (Check connections at the control board, at the bottom of the vendor's main door and at the vend motor coil... the wire number will be the same as the motor number).

3. Make a selection... While the display shows "hold", measure for voltage at the vend motor, on the wire coming from the control board to the vend motors coil (the wire will be the same number as the vend motor)... If the wire between the control board and the problem vend motor (s) has been tested to be fine during step 2, you should register 110 volts AC. If not, the control board may be defective.

4. If 110 volts AC is registered during step three. Check to ensure that you're getting neutral from through the sold out switch and to the vend motors coil. This can be done by testing for continuity **(with product in the vendor)** between the door/stack plug and the neutral vend motor wire that comes from the normally closed position of the sold out switch for that column. If this checks out OK, the vend motor could be defective.

Refrigeration System

Your vendor's refrigeration system comes as a completely sealed unit and should never be cut or tapped into or the warranty will be voided. The whole refrigeration system can be completely removed as a unit by:

1. Remove the product delivery chute which is located in the "cooling section" of the vendor's cabinet by first removing the 3/8" 1/4 - 20 hex head bolt. Then remove the Phillips head "locator" screw. Be *Extremely* careful when pulling out the chute not to damage the gray delivery sensor harness in any way (cutting, pinching or overextending the delivery chute).

2. Remove the evaporator cover by pulling off the two clips (located directly above the evaporator.).

3. Remove the four Phillips head screws at each edge of the front of the evaporator and untangle any wiring from around the suction line / evaporator tubing.

4. Remove the two Phillips head screws which are holding the cover over the suction line (black foam insulated tube recessed inside the "hat section"). This can be found inside the cooling section on the "tank bottom".

5. Remove the two 3/8" 1/4 - 20 hex head bolts holding the refrigeration base plate to the base of the cabinet.

6. Remove the two Phillips head screws which are attaching the condenser fan shroud (part of refrigeration base plate) to the baffle (to the left of the condenser in the base of the vendor). This will free up the base of the Refrigeration System.

7. If possible, place a piece of cardboard under the front of the refrigeration base plate so that the vendor base does not get scratched. Pull the base of the refrigeration system forward until the front edge of the refrigeration base plate hangs over the edge of the vendor base (Ease the evaporator / suction line forward if necessary.).

8. If possible, place another piece of cardboard on top of the condenser. Pull the evaporator forward and place it on top of the cardboard. The cardboard will help protect the condenser and evaporator fins.

IMPORTANT NOTE: The Refrigeration System is a sealed System and cannot be cut or tapped into.

• Cooling Compartment: The cooling compartment is the sealed area of the vendor that holds the product for delivery. This area is designed to allow free flowing air to circulate throughout the product.

• Compressor: The compressor motor is a hermetically sealed unit located beneath (outside) the cooling compartment. The compressor is a pump, driven by the compressor motor which draws low pressure vapor (refrigerant) from the evaporator coil, compresses it, and forces it into the condenser under high pressure. The motor is started and controlled by the temperature control.

• Condenser: The condenser coil is located beneath (outside) the cooling compartment next to the compressor (can be seen from the front with the door open). The condenser removes heat from the high pressure vapor discharged from the compressor and condenses it to a high pressure liquid. The condenser and evaporator coils have aluminum fins attached to effectively increase their heat exchange surfaces.

• Starting Relay: The starting relay is mounted on the side of the compressor housing. The compressor motor has two windings, a start and a run winding. To give the motor torque when it first starts, the starting relay switches in the additional start winding. After the motor gets up to speed the relay opens the start winding and the motor continues using only the run winding.

• Thermal Overload: The thermal overload is a heat sensitive device mounted on the side of the compressor housing. If the compressor motor gets too hot or draws an excessive amount of current, the thermal overload will open, breaking the circuit to the compressor. After the compressor cools to a safe operating temperature, the thermal overload will close allowing the compressor and condenser fan motors to restart.

• Condenser Fan & Motor: The condenser fan & motor, located beneath the cooling department, is a forced air device that uses outside ambient air to cool the surface of the condenser coil. The condenser fan motor runs while the compressor runs.

• Evaporator: The evaporator coil is located in the cooling compartment. As low pressure liquid passes through the evaporator coil, it absorbs and removes heat from the compartment as it changes to vapor. The condenser and evaporator coils have aluminum fins attached to effectively increase their heat exchange surfaces.

• Evaporator Fan & Motor: The evaporator fan & motor is a forced air device that circulates air throughout the cooling compartment and over the heat exchange surface of the evaporator coil. The evaporator fan motor runs continually.

• Capillary Tube: The capillary tube is located in the refrigerant line, between the condenser and evaporator coils. The small diameter tube is used as a metering device to control the flow of liquid refrigerant to the evaporator coil. This creates a low pressure causing the refrigerant to vaporize and absorb heat as it passes through the evaporator.

• Drier: The drier is located in the refrigerant line between the capillary tube and condenser. It traps and removes moisture from the refrigeration system while allowing oil and refrigerant to pass through the system.

• Accumulator: The accumulator is located in the refrigerant line between the evaporator coil and compressor. The accumulator traps any liquid refrigerant which did not vaporize before it reaches the compressor.

• Refrigeration Relay: The refrigeration relay is located in the lower section of the vendor's cabinet near the main wiring harness. It takes the place of the temperature control (thermostat) that has been used over the past several years in "electro-mechanical" vendor's. The refrigeration relay is responsible for powering the compressor and condenser fan motor. The refrigeration relay consists of a coil that is powered by the control board (24 volts DC) and a double pole switch.

When the control board completes the circuit to the refrigeration relays coil, the coil will energize, closing the contact between the common and the normally open positions. When this happens, power (110 volts) travels from the Refrigeration Relay to the main wiring harness for the refrigeration unit.

THE REFRIGERATION CYCLE

The rising temperature in the cooling compartment is reported to the control board through the Temperature Sensor.

The control board registers the current temperature inside the vendor's cabinet. When it rises equal to, or above the pre-programmed cut-in temperature, the control board will then complete the circuit to the refrigeration relay to energize its coil.

The refrigeration relay's "coil" closes the contact between the common and normally open positions allowing 110 volts to travel to the main wiring harness to start the compressor.

The compressor circulates refrigerant throughout the system by pulling low pressure refrigerant vapor from the evaporator coil, compressing it and forcing it into the condenser coil.

The condenser aided by the condenser fan motor, removes heat from the refrigerant as it flows through the condenser coil and releases it to the outside environment. The dropping of the refrigerant temperature changes the vapor to liquid.

The evaporator coil allows the liquid refrigerant to absorb heat from the cooling compartment as it evaporates in the coil.

The falling temperature in the cooling compartment is caused by the continual circulation of refrigerant through the system, removing heat from the cooling compartment and transporting it to the outside environment. When the temperature drops, the temperature sensor reports this to the vendor's main control board.

When the temperature drops below the preset cut out temperature the control board will disable the refrigeration relay thus killing power to the refrigeration unit.

Test: The refrigeration unit can be tested two different ways.

1. The "sealed refrigeration unit" can be tested by unplugging it from the top of the main wiring harness and plugging it directly into a power source. If the unit still does not operate, a problem exists within the sealed unit.

2. If the "sealed refrigeration unit" runs upon plugging it into an external power source. The problem more than likely lies between the control board, the refrigeration relay and the main wiring harness. For troubleshooting this circuit refer to Chapter 5, Troubleshooting.

Protective Components

Your Merlin III vendor is equipped with several protective components. In using electronics it is necessary to provide the electronic components with extremely "clean" power for them to operate properly. It is also necessary to provide the electronics with protection against high amperage caused by shorts. Listed in this section are three different types of protective components including their location, function and any information about testing.

• In-Line Filter Assembly: The Merlin III offers a 5 amp In-Line Filter Assembly which filters out any EMI or "Electro-Magnetic Interference" or "Line Spikes" going into the vendor's main door. It also keeps any interference caused by the vendor's electronics from entering the main power stream.

The In-Line Filter Assembly is mounted using two Phillips head screws in the bottom of the vendor's cabinet near the refrigeration unit, the refrigeration relay and the main wiring harness. The In-Line Filter Assembly consists of a 5 amp line filter, a harness which connects one side of the filter to the door harness, the other side of the filter to the main wiring harness and a green ground wire, which connects the filter to the vendor's cabinet using a Phillips head cutting screw.

• Iron Ferrite Bead Assembly: The Iron Ferrite Bead serves a similar purpose as that of the In-Line Filter Assembly. It is intertwined around the 110 volt ballast wiring. Its purpose is to eliminate electronic noise and to help eliminate line spikes emitted by the ballast. This could be in the form of EMI and/or Radio Frequency.

• In-Line Fuse box Assembly: The In-Line Fuse box Assembly is located in the vendor's changer plug bracket, which is mounted in the midsection of the vendor's main door. It houses a 3 AG / 4 amp (fast blow) fuse that fuses the 110 volt AC circuit for the vend motors. It will protect the control board in the case that a vend motor(s) would short out.

Example: If upon pressing any selection you see the word "hold" for 8 to 13 seconds, the vend motor does not run or dispense product and then the display registers "sold out"... If this happens with every selection for the first vend attempt and then every attempt after that, the display will automatically display "sold out"... You may have a blown vend motors fuse.

Chapter 3

Vendor Installation and Programming

Vendor Installation

Unpack the vendor: Unwrap the vendor and remove any padding. Check for signs of damage at the time of delivery, if the vendor is damaged, contact the carrier immediately. The carrier will instruct you as to the procedure for filing a claim.

1. The vendor keys are located in the coin return cup.
2. Remove stretch-wrap if storing the vendor in direct sunlight

Removing the shipping skids: Separate (split) each skid section by inserting either a claw hammer, crow-bar, or similar device into the slot of each section to break apart. Tilt the vendor slightly to remove the separated pieces.

Placing the vendor on location: When placing the vendor on location, allow for a minimum of four inches (4") of space at the rear of the vendor. This will ensure proper ventilation of the refrigeration system.

Level the vendor: Level the vendor by adjusting the four leveling legs on the bottom corners of the vendor. The vendor is level if the main door remains stationary when opened to different positions. The four leveling legs must be in contact with the floor. This is imperative for proper drainage of evaporator frost.

Voltage requirements: The vendor is designed to operate at a voltage of 115 volts, 60 hertz. It requires a minimum of 15 amp service. The service outlet voltage must not exceed 129 VAC or fall below 103 VAC.

Vendor power cord: The vendor has a 3 prong, three wire, grounding cord. The vendor must be plugged into a grounded electrical outlet to protect the customer from an electric shock. If you are not sure your outlet is properly grounded, have it checked by a qualified electrician.

Note: Extension cords are not recommended unless they are authorized before use by a certified electrician.

When you plug in your vendor you should observe the following:

1. The florescent lights displaying the vendor sign will come on.
2. The refrigeration compressor will start to run after approximately 3 minutes.
3. The L.E.D. display will light.

Controller Programming

Introduction to Programming

Controller programming is the process of assigning prices for selections, setting space to sales (columns to buttons), setting the refrigeration parameters (including cut in/cut out temperatures) and setting other optional settings. Programming allows you to customize your vendor for it's particular location to achieve maximum sales and to obtain as much information about your account as possible. Concerning vending, the three most important settings are the space to sales mode, set vending depth mode and the double columns mode. These settings should be set correctly for your type of vendor from the factory. If these settings are incorrectly set, you could experience erratic vending problems (multiple vending, slow vending or vending from the wrong column). The following section outlines how to program your "Merlin III" by describing the three menus available:

- Service Menu (Service functions only; read errors, test vend, coin payout, etc.)
- Password Protected Menu (Vendor setup; set pricing, set space to sales, etc.)
- External menu (Read errors & can counts)

IMPORTANT NOTE: It is recommended that you follow through the program steps thoroughly to become familiar with the programming buttons, each mode and the vendor's capabilities.

Programming Button Functions

The Merlin III vendor (RVCCE models) uses 4 button programming. To program your vendor, you need to press the control board's mode button, then you will use the first four select buttons to accomplish all programming. *If anything needs to be remembered about controller programming, this is it!* The pages to follow will review steps to program each mode. All steps will use the names listed below instead of the select switch number. It is extremely important that you be able to match the select switch number to its name!

SELECT SWITCH	NAME	USAGE
Select switch #1	<home>	Escape, Return, etc.
Select switch #2	<up>	Increase, Next, etc.
Select switch #3	<down>	Decrease, Previous, etc.
Select switch #4	<enter>	OK, Accept, Save, etc.

Selection #1 **<home>** = This selection is named the "Home Button". Its purpose is to bring you out of a particular menu level to the previous menu level each time this button is pressed. In most uses pressing home to exit will also save any changes. See the example below.

Selection #2 **<up>** = This selection is named the "Up Button". Its purpose is to move you to the next mode on a particular menu level. It will also allow you to raise the value of any current settings once into a desired mode, such as increasing a vend price once into the vend price mode. See the example below.

Selection #3 **<down>** = This selection is named the "Down Button". It performs just the opposite of the #2 select button; its purpose is to move you to the previous mode on a particular menu level. It will also allow you to lower the value of any current settings once into a desired mode. such as decreasing a vend price once into the vend price mode. See the example below

Selection #4 **<enter>** = This select button may be the most important button of the four. It's name is the "Enter Button". The purpose of this button is to enter into a particular menu level in the quest to check or change current settings. During a set of program procedures you must use this button to allow you to enter level upon level until finally reaching the point where a change is desired. In some cases you must press this button one last time to allow the change.

EXAMPLE: Nickel Payout

After opening the vendor's main door and pressing the control board's mode button the L.E.D. Display should show "Eror" on 10.04 control boards or "rtn" on 10.02 boards (This will be the starting point for all menus and modes).

1. 10.04 - To get to the Coin Payout mode you must move forward through the service menu by pressing the #2 select button (**<up>**) once, the Display will show "CPO" (Coin Payout). 10.02 - To get to the Coin Payout mode you must move forward through the service menu by pressing the #2 select button (**<up>**) twice, then the Display will show "CPO" (Coin Payout).

2. To enter the Coin Payout mode you must press select button #4 (**<enter>**). Upon entering the Coin Payout mode, the Display will show ".05".

3. To payout a nickel press select button #4 (**<enter>**). If this selection is held, payout will continue.

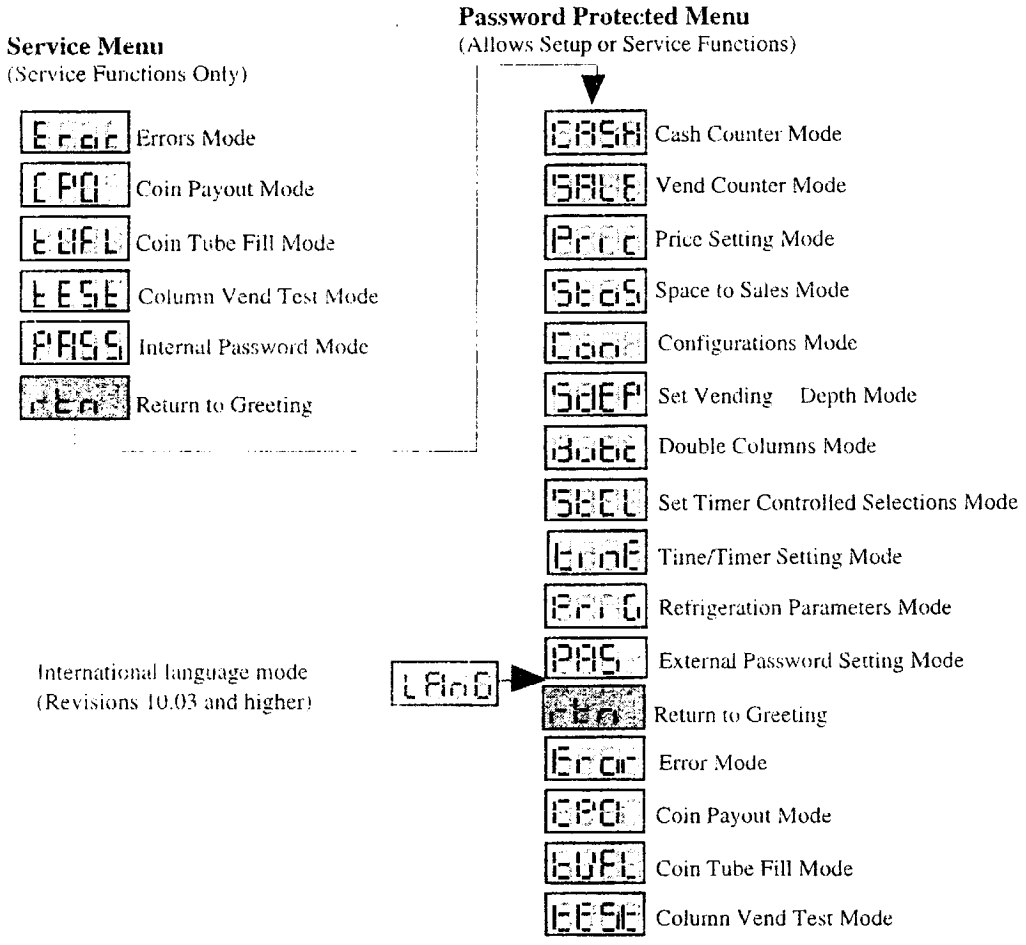
4. To exit the "CPO" mode you must press selection #1 (**<home>**) as many times as the enter button is pressed to enter the mode only (do not count pressing it to perform functions). In this case since **<enter>** was only pressed once to enter the coin payout mode, you must press **<home>** one time to exit the coin payout mode. This will take you back to the main menu.

Menu Chart (CODE LEVEL)

Menu: The word "Menu" refers to a list of modes to choose from It will also be referred to as the "code level". Listed below are the service and password protected menus. Upon opening the vendor's main door and pressing the control board's mode button you will be at the service menu. The "PASS" mode of the service menu will allow you enter the password protected menu shown to the right of the service menu.

Mode: The word "mode" refers to a specific section of the program menu that will allow you to perform a certain function or that will allow you to customize the vendor. Listed below are two of the three available menus (The service menu and the password protected menu). To travel through either of these menus you must press the #2 or #3 select buttons. Upon reaching the last menu on the list, you will "wrap around" and return to the first mode on the list.

Note: The 10.02 Service Menu will begin with "rtn" and end with "Pass".
Note: "rtn" in the password protected menu was at the complete end of the menu on revision 10.04 and lesser revision control boards.



Service Menu

This section completely outlines all Service Menu modes including a description and operation for each. The service menu was designed to give you access to several features such as vendor diagnostics, changer payout/accountability and column vend testing. This may come in handy for a third party operator which is not permitted to change vendor setup such as space to sales or prices. All vendor setup is done in the password protected menu which requires a password for viewing or setting (described in the next section "password protected menu"). **After 5 minutes without activity the control board will revert to the sales mode (the L.E.D. will show the greeting).** Upon pressing the control board's mode button the display will show "Eror" and you will be at the beginning of the Service Menu. After doing this use four button programming to navigate through the following "Service" modes.

Eror ERRORS

Description: This mode was designed to help diagnose vendor problems... Upon opening the vendor's main door, the L.E.D. will flash any possible error (For a list refer to Chapter 5 "Reading Error Codes"). If there are no errors, the display will momentarily flash "none" and revert to the sales greeting (ICE COLD COCA COLA). The errors Menu was designed to give you a detailed description of each error and allow you to clear errors.

Operation: If **<enter>** is pressed when the display shows "Eror" the controller will enter into the errors descriptive display mode. At this point, the display will show any and all current vendor errors followed by the descriptives for each. If no errors exist "none" will appear on the display. If **<home>** is pressed anytime during this operation, the controller will return to the beginning code level (display shows "Eror"). From "Eror" pressing select button #3 will take you to "rtn" and pressing select button #2 will take you to "CPO".

Clearing Errors: To clear an error, wait until the error to be cleared is shown on the L.E.D. display, then immediately press either the **<up>** or the **<down>** button and hold it in for at least two seconds and the error will disappear. Follow this procedure for each error.

CPO COIN PAYOUT

Description: This mode allows you to payout coins from the coin mechanism's tubes through the control board. This mode is mainly used because some coin mechanisms do not have payout buttons/switches on them. This can also be used as a test to confirm the control boards ability to payout coins (will act the same as after a sale).

Operation: If **<enter>** is pressed when the display shows "CPO" the controller will enter the coin payout mode and display the lowest coin value (.05). Using **<up>** or **<down>** will allow the user to cycle through all coin values that are available for payout. If **<enter>** is pressed at this point, a coin of the displayed value will be paid out. Coins will continue to payout as long as **<enter>** is held down. If **<home>** is pressed anytime during this operation, the controller will return to the beginning code level (display shows "CPO"). From "CPO" pressing select button #3 will take you to "Eror" and pressing select button #2 will take you to "tUFL".

Note: If you are using the "tUFL" you must use this "CPO" mode to payout coins.

tUFL COIN TUBE FILL

Description: This mode is used to keep inventory of the exact coin tube levels as each coin is inserted. During this mode the L.E.D. display will register each coin as it is inserted (in no particular order) and report its value to the vendor's control board. The control board will in turn, remember the coin mechanism's coin tube levels and automatically deduct coin each time a coin is paid out (through "CPO" mode or during a vend.)

Note: The use of the coin mechanism's manual coin payout buttons is discouraged to keep from corrupting the coin counts.

Operation: If **<enter>** is pressed when the display shows "tuFL" the controller will enter the coin tube fill mode. The L.E.D. display will go blank which will allow the deposit of nickels, dimes or quarters through the coin insert or coin acceptor inlet chute. If **<home>** is pressed anytime during this operation, the controller will return to the code level (display shows "tuFL"). From "tUFL" pressing select button #3 will take you to "CPO" and pressing select button #2 will take you to "tESt".

tESt VEND TEST

Description: The vend test mode is used to vend test by column, not by selection. After entering into this mode you will have to pick the column which is desired to be tested, then by pressing the enter button (#4 select button) the control board will vend from that column... No money needed. This mode is to vend test only, it will test the control board's ability to receive 110 volts at the vend motor's connection and then distribute it to the proper vend motor upon command. It will also test the "mechanical" part of the vending circuit such as the vend motor oscillator or rotor and any shimming that may be used. It does not test the control board's coin acceptance/credit/payout circuit.

Operation: If **<enter>** is pressed when the display shows "tESt" the controller will enter the column vend test mode and the display will show "CO 1" (column 1). Using **<up>** or **<down>** will cycle you through all the available columns to be test vended (the display may show some columns that are not in your vendor; nothing will happen if a test vend is attempted from these columns.). If **<enter>** is pressed the controller will attempt to test vend from the column which is being displayed. Pressing **<home>** will only return you to the code level (display shows "tESt") if a vend is not in progress. From "tESt" pressing select button #3 will take you to "tuFL" and pressing select button #2 will take you to "PASS".

Note: Test vends will not affect cash or sale counters.

PASS INTERNAL PASSWORD

Description: The internal password mode is used to access to the "password protected menu" (described later). The password protected menu contains all modes necessary for vendor setup. Without entering this password, no setup can be done.

Operation 10.04 boards: When the display shows "PASS" to enter the password you must press select buttons **4** then **2** then **3** then **1**. After the password has been successfully entered you must press **<enter>**. If you did not enter this password correctly or if the control board does not register the password, after 15 seconds has elapsed the display will revert back to "PASS". Remember the password is **4 - 2 - 3 - 1** and is *non-changeable*. After the password has been successfully entered, "CASH" will appear on the display and you will be at the beginning of the password protected menu. Without entering a password, from "PASS" pressing select button #3 will take you to "tESt" and pressing select button #2 will take you to "rtn".

Operation 10.02 &10.03 boards: When the display shows "PASS" to enter the password you must press **<enter>** then enter the 4 digit password by pressing select buttons **4** then **2** then **3** then **1**. If you did not enter this password correctly or if the control board does not register the password, after 15 seconds has elapsed the display will revert back to "PASS". Remember the password is **4 - 2 - 3 - 1** and is *non-changeable*. After the password has been successfully entered, "CASH" will appear on the display and you will be at the beginning of the password protected menu. Without entering a password, from "PASS" pressing select button #3 will take you to "tESt" and pressing select button #2 will take you to "rtn".

rtn RETURN

If **<enter>** is pressed when the display shows "rtn", the controller will revert to a sales mode and the greeting will be displayed. From "rtn" pressing select button #3 will take you to "PASS" and pressing select button #2 will take you to "Eror".

Password Protected Menu

The password protected menu allows access to all "set-up" modes and provides protection against unauthorized setup changes. All of the service modes are added the end of the password protected menu in case some of their functions are needed.

This section completely outlines all password protected menu modes. Including descriptions and operation instructions for each mode. **After 5 minutes without activity the control board will revert to the sales mode (the L.E.D. will show the greeting).**

CASH CASH COUNTER

Description: The cash counter mode allows you to manually extract the amount of cash taken into the vendor through product sales (up to $999,999.99). The cash counter mode consists of a total count which is non-resettable and individual counts per selection which are resettable depending upon the proper configuration setting (see configurations). The counts could possibly be displayed in 1 or 2 sets of 4 digits. Examples for both types of counters are as follows:

1. If the total cash count was $56,789.10. Upon entering the cash mode the display would flash *"CASH"*, followed by *"567"*, followed by *"89.10"*.

2. If the individual cash count for selection 1 was $6,789.10. Upon accessing the individual count for selection 1 the display would flash *"CL 1"*, followed by *"67"*, followed by *"89.10"*.

Operation: If **<enter>** is pressed when the display shows "CASH" the controller will enter the cash counter mode and the display will flash "CASH" then the total amount of cash taken into the vendor. This could possibly be shown in 2 sets of 4 digits (see example 1 above). Using **<up>** or **<down>** will cycle through individual cash counts for each selection and the display will flash individual counts as shown in example 2 above. If **<home>** is pressed anytime during this operation, the controller will return to the code level (display will show "CASH"). From "CASH" pressing select button #3 will take you to "rtn" of password protected menu" and pressing select button #2 will take you to "SALE".

Clearing individual counters: If the configurations mode is set to allow the individual counters to be reset, the individual counters will reset upon reading at least one of them and closing the vendor's main door or actuating the vendor's door switch.

SALE SALE COUNTER

Description: The sale counter mode is very similar to the cash counter mode. It allows you to manually extract the amount of product dispensed through your vendor (up to 99,999,999). The sale counter mode consists of a non-resettable total count and individual counts per selection which are resettable depending upon the proper configuration setting (see configurations). The counts could possibly be displayed in 1 or 2 sets of 4 digits. Examples for both total and individual counters are as follows:

1. If the total product vended was 5,678,910. Upon entering the sale mode the display would flash *"SALE"*, followed by *"567"*, followed by *"8910."*.

2. If the individual sale count for selection 1 was 678,910. Upon accessing the individual count for selection 1 the display would flash *"SL 1"*, followed by *"67"*, followed by *"8910."*.

Operation: If **<enter>** is pressed when the display shows "SALE" the control board will enter the sales counter mode and the display will flash "SALE" then the total amount of sales made by the vendor, possibly in two sets of 4 digits (see example 1 above). Using **<up>** or **<down>** will cycle through individual sale counts for each selection and the display will flash individual counts as shown in example 2 above. If **<home>** is pressed anytime during this operation, the controller will return to the code level (display will show "SALE"). From "SALE" pressing select button #3 will take you to "CASH" and pressing select button #2 will take you to "Pric".

Clearing Individual Counters: If the configurations mode is set to allow the external individual counters to be reset, the individual counters will reset upon reading at least one of them and closing the vendor's main door or actuating the vendor's door switch.

PrIC PRICE SETTING

Description: The price setting mode is used to set vend prices. Depending on the configurations mode settings (discussed later in this section), this mode will allow you to set either single or multi- pricing. When the configurations are set to allow single pricing, only one price has to be set in the "PriC" mode (not individually) and the current price will be displayed on the L.E.D. display during the greeting. If the configurations are set to allow multiple pricing (per selection), the display will not show the vend price during the greeting unless all selections are set to the same price. You will have two options when setting Multiple prices: "ALL" Pricing - Gives you the option to set one price for all selections, then set individual prices for any selection that is different. Individual Pricing - Allows you to set a different vend price for each selection. If a free vend keyswitch is in use (turned on) the display will scroll "FREE" during the greeting instead of the normal vend price.

Note: On 10.02 revisions it may be necessary to set the space to sales setting first to eliminate any "no-b" (no button) messages.

Note: On 10.02 revisions it is not necessary to press the enter button to save any recently changed price.

Operation: If **<enter>** is pressed when the display shows "PriC" the controller will enter the price setting mode.

Single Price Operation: the display will flash "SPri" then the current single price setting. This will be the single price viewing level. If **<enter>** is pressed again, the display will show the current single price only. If **<up>** is pressed or held, the price will increase in .05 increments. If **<down>** is pressed or held, the price will decrease in .05 increments. After the desired price has been set press **<enter>** to save your setting and return to the single price viewing level. Pressing **<home>** after changing the price will return you to the single price viewing level without saving any changes. Pressing **<home>** from the single price viewing level will return you to the code level display of "PriC".

Multiple Price Operation: The display will flash "ALL" followed by the last price that was set for all selections. If **<enter>** is pressed at this point, the display will steadily show the current "ALL" price. If **<up>** is pressed or held, the price will increase in .05 increments. If **<down>** is pressed or held, the price will decrease in .05 increments. After the desired price has been set press **<enter>** save your setting and return to where the display flashes "ALL" followed by the new "ALL" price. Pressing **<home>** after changing the price will return to where the display flashes "ALL" followed by the new "ALL" price without saving any changes. You may now set a few, all or different individual prices if desired.

Individual Pricing: If **<up>** or **<down>** is pressed when the display flashes "ALL" followed by the current majority price setting, the display will cycle through the individual price settings for each selection. The display will flash the selection number followed by the price for that selection. Example: If selection 1 is set at fifty cents the display would flash "P 1" followed by ".50".

Pressing **<enter>** while a individual selection is being displayed will cause the display to steadily show the vend price for that selection to allow a change to the price. Press **<up>** to increase the price value in .05 increments or **<down>** to lower it in .05 increments. After the desired price has been set press **<enter>** to save your setting and return to where the display flashes "P ?" followed by the new selection price. Pressing **<home>** after changing the price will return to where the display flashes "P ?" followed by the new selection price without saving any changes. Pressing **<home>** while at the "majority price viewing level" will return you to the code level (display shows "PriC"). From "Pric" pressing select button #3 will take you to "SALE" and pressing select button #2 will take you to "StoS".

StoS SPACE TO SALES

Description: The space to sales setting mode is a very important part of programming. It will determine what column will vend (what product will dispense) upon pressing a particular select button. You will use this mode to program column assignments by assigning a column (or columns) to each selection button that you desire to use.

You may also decrease the number of the vendor selections. Example: Your vendor has a total of nine select buttons on the front panel. If you wish, you may program the controller to only use 8, 7 or 6 selections, or even less. This is done by assigning all additional columns to one of the selections used, then blocking off the unused selections with a cover plate. This will come in handy if a fewer total number of flavors are needed than the amount of select buttons on the front panel. A benefit to doing this is that you will be allowed to allocate the "extra" columns to a "faster moving" flavor. Space to sales will come factory set for your type of vendor. Upon entering the space to sales mode two different types of settings are available:

* **Factory Standard Space To Sales** - The factory standard setting will allow you to quickly configure one of twelve types of factory settings. When choosing one of these, each column will automatically be assigned to its predetermined selection. You will have the option to program the same number of columns as buttons (Example: nine selections, nine columns = OPt 9). You may program one less selection than the number of columns, which will always allow selection 1 to sequence vends between columns 1 and 2 (Example: nine selections, ten columns = OPt a).

* **Custom Space To Sales** - You will be allowed to assign any column to any selection. User beware, you will also be allowed to program double assigned columns (one column to more than one select button) or leave some columns unassigned. Both of these types of column assignments are not advised but sometimes unavoidable. If either of the two is done, an error code will be shown on the L.E.D. display upon door opening (see Chapter 5 for Reading errors).

Settings (10.02)	Settings (10.04)	Meaning
0-0	OPt 0	0 selections, 0 columns. This is used to reset space to sales. "clear" for custom settings. *Do not* <enter> here unless using custom space to sales.
5-5	OPt 1	5 selections, 5 columns
5-6	OPt 2	5 selections, 6 columns with sequencing
6-6	OPt 3	6 selections, 6 columns
6-7	OPt 4	6 selections, 7 columns with sequencing
7-7	OPt 5	7 selections, 7 columns
7-8	OPt 6	7 selections, 8 columns with sequencing
8-8	OPt 7	8 selections, 8 columns
8-9	OPt 8	8 selections, 9 columns with sequencing
9-9	OPt 9	9 selections, 9 columns
9-10	OPt A	9 selections, 10 columns with sequencing
10-10	OPt b	10 selections, 10 columns
CStS	CStS	Custom Space To Sales

Operation:

10.02 - If **<enter>** is pressed when the display shows "StoS" the controller will enter the space to sales setting mode. The controller will always enter at 0-0 no matter what the current setting. This will be the start of the space to sales setting list.

10.03 and greater - If **<enter>** is pressed when the display shows "StoS" the controller will enter the space to sales setting mode. The board will always enter at the current space to sales setting... If your vendor is programmed for custom space to sales or if programmed with a hand held computer you will enter at "CStS".

If **<up>** or **<down>** is pressed at this point you will be allowed to cycle through all 13 space to sales settings.

Factory Standard Settings

Pressing **<enter>** at any factory standard setting will "lock in" or reprogram the control board for that particular space to sales setting. Upon doing this, the display will automatically start sequencing through all selections and the columns that are assigned to each.

Example: If after entering a factory standard setting the display flashes "SL 1", then flashes "1", then flashes "2". Selection one has assigned to it, columns 1 and 2 only. This will occur for each selection.

Custom Space to Sales Settings

Note: Anything done in this mode will override any previously assigned factory standard or custom settings.

Pressing **<enter>** at "CStS" will allow you to enter the Custom Space To Sales mode. Upon entering this mode the display will always start by Flashing "SL 1" (selection 1) followed by flashing each column number that is assigned to this selection. Example: The display flashes "SL 1", then flashes "1", then flashes "2". Selection one has columns 1 and 2 only assigned to it. Pressing **<up>** or **<down>** at this point will allow you to cycle through selections 1 through 10, each selection showing the columns that are assigned to it. If **<enter>** is pressed at a selection the display will show "Co 1". This stands for column 1 for that particular selection. Pressing **<up>** or **<down>** at this point will allow you to cycle through columns 1 through 10 for the selection that was entered. If any column is flashing, this means that it is assigned to the selection. If a column is *not* flashing then it is *not* assigned to the selection. Pressing **<enter>** will change a columns "flashing" condition. This will allow you to assign or unassign columns. If no changes are made, pressing **<home>** will return you to the space to sales setting list at "CStS". If a change to a selection is made, pressing **<home>** will return you to the selection level where the display flashes the selection number and the columns which are assigned to that selection. **Follow the above process for all selections in which you wish to set.**

When completely finished in custom space to sales, pressing **<home>** will return you to code level (display shows "StoS"). From "StoS" pressing select button #3 will take you to "PriC" and pressing select button #2 will take you to "Con"

Con CONFIGURATIONS

Description: The Configurations mode is used to set vendor options dealing with pricing, acceptance, payback and a few other optional features. Although most of the features are optional it is advised that you check the pricing configuration (C1) which allows you to set a single or multi-price before setting prices. If this configuration is set to allow single pricing you will only be allowed to set one price.

Reading the configurations mode: While in the configurations mode the display will show the configuration followed by the current setting. If the display shows "C 1 0" this means that configuration 1 is currently set to 0. In other words, the vendor is set for single pricing.

Configuration	Meaning
C 1	0 = single pricing. 1 = multi- pricing.
C 4 (10.05+)	0 = display shows errors only upon opening main door 1 = display shows total sales count (Shown the same as in the sale mode) followed by total cash count (shown the same as in the cash mode) followed by "Eror" (if any errors exist).
C 5	0 = no reset on individual counts. (Allows external clear.) 1 = reset on individual counts.
C 6	0 = credit will be returned if proper change can't be made. 1 = allow vend regardless of changer tube levels (Proper change may not be paid back).
C 7	0 = will only accept a bill if coin tubes have enough coins to cover the difference between the bill value and the maximum price. 1 = allows bill acceptance regardless of payout availability.
C 8	0 = credit is not returned if the maximum price has been reached with coin credit, or if any bill credit is present, unless a sold out selection is made 1 = credit is always returned
C 9	0 = change is automatically returned to customer after a valid vend. 1 = holds customer's refund in escrow to allow another purchase.
C 10	0 = no "USE Coin OnlY" message. 1 = display "USE Coin OnlY" message during greeting.
C 11 (10.06+)	0 = clear unpaid change after 5 minutes 1 = retain unpaid change as credit for next customer
C 13 (10.06+)	0 = normal bill action 1 = escrow bill if selection or entire vendor is sold out (providing C7 is set to "1").

Operation: If **<enter>** is pressed when the display shows "Con" the controller will enter the configurations mode. The display will show configuration 1 and its setting (as listed in the configurations description). If **<up>** or **<down>** is pressed at this point the display will cycle through each configuration. Pressing **<enter>** while the display shows a configuration will allow that current configuration setting to start flashing. Pressing **<up>** or **<down>** while the current configuration setting is flashing will allow you to toggle that configuration setting between 0 and 1. If changes are made to a configuration, pressing **<enter>** will return you to the configuration list level and save any change. Follow the above process for all configurations in which you wish to set. When done pressing **<home>** will return you to code level (display shows "Con"). From "Con" pressing select button #3 will take you to "StoS" and pressing select button #2 will take you to "SdEP".

SdEP SET VENDING DEPTH

Description: Since the vend motors on a Merlin III vendor do not have either cams or switches, programming the vending depth is extremely necessary. With older style "Electro-Mechanical" vendors it was necessary to adjust the vend timing cam by either filling notches or rotating part of the cam to change the vending depth from triple or double to single depth.

10.02 - The depth setting represents selections. Setting the depth for one selection will set the depth for all columns assigned to that selection in StoS.

10.03 and greater - The depth setting represents columns. It is necessary to program the correct depth for each column to prevent multiple or slow vends.

Operation: If **<enter>** is pressed when the display shows "SdEP" the controller will enter the set vending depth setting mode and the display will show "ALL". From this point two types of settings are available: the "All" depth setting will enable you to set all depths the same (such as "ALL" of the price mode) and "Individual" depth settings give you the option to set all depths individually for each selection (10.02) or column (10.03+).

"All" setting

If **<enter>** is pressed when the display shows "ALL", the control board will enter the ALL depth setting mode. The display will steadily show "ALL" and flash the current depth setting. Pressing **<up>** or **<down>** will allow you to change the flashing depth setting. Range: 1, 2, or 3. Pressing **<home>** will return you to where the display will show "ALL". At this time you will be able to cycle through each individual depth setting. Pressing **<home>** from the individual level ("ALL") will return you to the code level (display shows "SdEP").

Individual setting

If **<up>** or **<down>** is pressed when the display shows "ALL", the controller will cycle through each individual setting showing the selection (10.02) or column (10.03+) number and the current setting. If **<enter>** is pressed while the display is showing an individual depth setting, the current setting will start flashing. Pressing **<up>** or **<down>** will allow you to change the flashing depth setting. Setting Range: 1, 2, or 3. Pressing **<home>** will lock in your setting and return you to the individual level at the point where you entered it (at the setting just changed). At this time you will be able to cycle through each individual setting. Pressing **<home>** from the individual level will return you to the code level (display shows "SdEP"). From "SdEP" pressing select button #3 will take you to "Con" and pressing select button #2 will take you to "dubc".

dubc DOUBLE COLUMNS

Description: Since the Merlin III control board can be used in such a wide variety of different size vendors, it is necessary to program the control board for it to know what type of vendor that it's in. Of the vendors that are in use, there are different column configurations, using both wide and narrow columns. A wide column takes less "run time" to reload after dispensing a load of product (after a series of vend cycles) than a narrow column does. For instance, once a wide column vends the rear product on one side, it will run a second or two to longer to position the oscillator so that the next time a customer vends from this column, the vend will occur immediately. The narrow column rotor, upon vending the rear product, must rotate completely (almost 360°) around to reload and prepare for the next vend.

Note: The double column setting ranges from 0 to 10 and are factory set for your size of vendor. Replacement boards will be set for "4".

Operation: If **<enter>** is pressed when the display shows "dubc" the controller will enter the double column (wide column) setting mode and the display will show "dc" then flash the current double column setting. Pressing **<up>** or **<down>** will allow you to change the flashing double column setting from 0 to 10. Pressing **<home>** any time during the process will return you to the code level and the display will show "dubc". From "dubc" pressing select button #3 will take you to "SdEP" and pressing select button #2 will take you to "StCL".

StCL SET TIMER CONTROLLED SELECTIONS

Description: This mode is used to choose the selections to turn off either using the "built in" timer or with the optional key switch kit. This mode must be set to enable one or all of the selections for the timer or the key switch to operate. This mode will allow you to set all selections to operate with the timer (or ignore it) by using the "ALL" setting. It will also allow you to set individual selections. Example: If the display shows "t 4 1", this means that selection 4 is set to operate with the timer or key switch.

Setting	Meaning
0	Off, will not operate with the timer or key switch
1	On, will operate with the timer or key switch

Operation: If **<enter>** is pressed when the display shows "StCL" the controller will enter the set timer controlled selections mode, at the selection level and the display will show "ALL". From this point, two types of settings are possible:

"All" setting

If **<enter>** is pressed when the display shows "ALL and the current setting" the control board will enter the ALL setting mode. The display will steadily show "ALL" and flash the current "StCL" setting. Pressing **<up>** or **<down>** will allow you to change the flashing setting to 0 or 1. Pressing **<home>** any time during this process will return you to the selection level and the display will show "ALL and current setting". At this time you will be able to cycle through each selection to set individual settings (Listed next). If completely done, pressing **<home>** from the selection level (display shows "ALL and current setting") will return you to the code level (display shows "StCL").

Individual setting

If **<up>** or **<down>** is pressed when the display shows "ALL and the current setting" the controller will cycle through each selection showing the selection number and the current setting for that selection. Example: If the display shows "t 3 1" = For selection 3, the timer is set to on. If **<enter>** is pressed while the display is showing an individual selection timer setting, the current setting for that selection will start flashing. Pressing **<up>** or **<down>** will allow you to change the flashing timer setting to 0 or 1. Pressing **<home>** will lock in your setting and return you to the selection level at the point where you entered it (at the selection just changed). At this time you will be able to cycle through each selection to set other individual timer controlled selection settings (see below). Pressing **<home>** from the selection level (display shows "ALL and current setting") will return you to the code level (display shows "StCL"). From "StCL" pressing select button #3 will take you to "dubc" and pressing select button #2 will take you to "tinE".

tinE TIME AND TIMER SETTINGS

Description: The "tinE" mode is used mainly to turn selections, lighting and /or refrigeration off and back on during pre determined times of the day and days of the week.

In the "tinE" mode you must set the current year, date, hour and the day of the week for the timer to operate. The "tinE" mode is also used to set each "on" and "off" time in which the timer will operate. Within the "tinE" mode there are several different functions which are listed below with a meaning and example for each.

10.02-.03 Function	10.04+ Function	Meaning	Display Example
yEar	yEar	Set the current year	19.95
date	date	Set the current month/day	03.28 = March 28
hour	hour	*Set the current hour/minute	14.31 = 2:31pm
***Setd	**not avail.**	Set the current day of the week	tuE = Tuesday
StOP	StOP	**Turn clock off to conserve battery	"CLOC" then "StOP"
daY	daY	*Set timer "on" and "off" times	------
dSt	dSPt	Display current time on L.E.D.	------
dSLt	dISt	Daylight savings setting	------

* Times are set using military time and if shown during sales mode are in 12 hour time.
** StOP is used to turn the clock off when in storage to save the controllers battery
*** Setd is only on revision 10.02 and lesser revision control boards. (see note #5)

Notes: 1. Revisions 10.02 and less: does not recognize daylight savings time to automatically change foreword or back 1hr. Settings need to be done manually or with H.H.C. Revisions 10.03 and higher: Will recognize daylight savings time ("dSLt" mode)
2. The Merlin III controller does not recognize leap year on revisions 10.03 and less.
3. The timer's "on" and "off" time settings is when the timer will operate to control the selections, lighting or refrigeration system.
4. The "built-in" lithium battery shelf life (vendor unplugged):
   - 3 years with clock turned on
   - 10 years with clock turned off (done in the "StoP" mode)
5. The day of the week setting on revision 10.03 and higher control boards is automatically set by programming the current date and the current year.

Operation: If **<enter>** is pressed when the display shows "tinE" the controller will enter the time and timer settings mode and the display will show "yEar". Pressing **<up>** or **<down>** will allow you cycle through each "tinE" function. Pressing **<home>** while the display is showing any of the earlier listed "tinE functions" will return you to code level where the display shows "tinE".

 YEAR

If **<enter>** is pressed when the display shows "yEar" the controller will enter the year setting "tinE function" and the display will show the current year, with the first two numbers of the year flashing (Example: **19**.00). Pressing **<up>** or **<down>** will allow you to change the first two numbers of the year. If **<enter>** is pressed from this point, the first two numbers of the year will "lock in" and the second set of two digits will start flashing (Example: 19.**95**). Pressing **<up>** or **<down>** will allow you to change the second two numbers of the year. Pressing **<home>** any time during the process will return you to the beginning of the year "tinE function" where the display shows "yEar". From "yEar" pressing select button #3 will take you to "dSt" and pressing select button #2 will take you to "datE".

 DATE

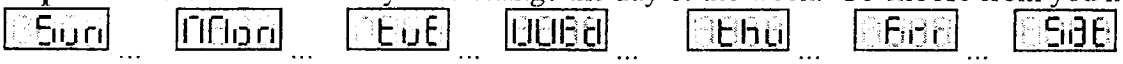
If **<enter>** is pressed when the display shows "datE" the controller will enter the date setting "tinE function" and the display will show the current date, with the first two numbers of the date flashing to indicate the month (Example: **03**.00). Pressing **<up>** or **<down>** will allow you to change the first two numbers of the date. If **<enter>** is pressed from this point, the first two numbers of the date will "lock in" and the second set of two digits will start flashing to indicate the day (Example: 03.**28**). Pressing **<up>** or **<down>** will allow you to change the second two numbers of the date. Pressing **<home>** any time during the process will return you to the beginning of the date "tinE function" where the display shows "datE". From "datE" pressing select button #3 will take you to "yEar" and pressing select button #2 will take you to "hour".

 HOUR

If **<enter>** is pressed when the display shows "hour" the controller will enter the hour setting "tinE function" and the display will show the current hour in military time with the first two numbers of the hour flashing (Example: **14**.00). Pressing **<up>** or **<down>** will allow you to change the hour. If **<enter>** is pressed from this point, the first two numbers of the hour will "lock in" and the second set of two digits will start flashing to indicate the minutes (Example: 14.**31**). Pressing **<up>** or **<down>** will allow you to change the second two numbers of the hour. Pressing **<home>** any time during the process will return you to the beginning of the hour "tinE function" where the display shows "hour". From "hour" pressing select button #3 will take you to "datE" pressing select button #2 will take you to "Setd" (10.02) or "StOP" (10.03 and greater).

 SET DAY OF WEEK **(10.02 and lesser revisions only)**

If **<enter>** is pressed when the display shows "SEtd" the controller will enter the set day setting "tinE function" and the display will start flashing the current day of the week. Pressing **<up>** or **<down>** will allow you to change the day of the week. To choose from you have:



Sunday ... Monday ... Tuesday ... Wednesday Thursday ... Friday ... Saturday

Pressing **<home>** any time during the process will "lock in" your change and return you to the beginning of the set day "tinE function" where the display shows "SEtd". From "SEtd" pressing select button #3 will take you to "hour" and pressing select button #2 will take you to "StOP".

 STOP CLOCK

If **<enter>** is pressed when the display shows "StOP" the controller will enter the stop clock setting "tinE function" and the display will flash "CLOC" and "StOP". Pressing **<enter>** will turn off the clock to reserve the controllers "built in" battery. The display will flash "Off" and automatically exit back to the display of "StOP". Pressing **<home>** any time during the process will return you to the beginning of the stop clock "tinE function" where the display shows "StOP". From "StOP" pressing select button #3 will take you to "Setd" and pressing select button #2 will take you to "day".

 TIMER ON OFF TIMES

If **<enter>** is pressed when the display shows "daY", the controller will enter the "tinE function" to allow you to set the timer on/off times for each day of the week. The display will show "ALL" and from this point you have two different options:

* "ALL" setting - Allows you to simply set your on/off times to enable the timer to operate using the same times everyday.

* "Days of the week" settings - Allows you to pick a select few days of the week in which you want the timer to operate (Example: Operation Monday through Friday only).

Pressing **<up>** or **<down>** will allow you to cycle from "ALL" to each day of the week. If **<enter>** is pressed, either at "ALL" or at a week day, the controller will enter into that particular day and the display will show "SC-1" then "On" then the current first off time for selections (listed below at top of list). From here on this will be referred to as the timer setting mode "viewing only" level. If **<up>** or **<down>** is pressed at the timer setting mode "viewing only" level the display will cycle to all other available timer setting modes:

10.02-03 Settings	10.04 Settings	Meaning
SC-1 On	SC-1 On	First off time for selections chosen in "StCL mode".
SC-1 Off	SC-1 Off	First on time for selections chosen in "StCL mode".
SC-2 On	SC-2 On	Second off time for selections chosen in "StCL mode".
SC-2 Off	SC-2 Off	Second on time for selections chosen in "StCL mode".
FriG On	FriG On	Time in which refrigeration system will shut off.
FriG Off	FriG Off	Time in which refrigeration system will come back on.
*LitE On	*Lt-1 On	Time in which lighting system will shut off.
*LitE Off	*Lt-1 Off	Time in which lighting system will come back on.
	*Lt-2 On	Second time in which lighting system will shut off.
	*Lt-2 Off	Second time in which lighting system will come back on.

* Must have the optional light relay kit for this feature to work.

To set "on" and "off" times for the timer you must press **<enter>** upon reaching the desired timer setting mode. After doing this the controller will enter into that particular timer

setting mode and the display will show the current setting with the hour flashing. This indicates that the hour can now be changed. Pressing **<up>** or **<down>** will allow you to change the hour of this particular setting. Pressing **<enter>** will "lock in" the hour setting and start the minutes flashing, which will indicate to you that the minutes can now be changed. Pressing **<up>** or **<down>** will allow you to change the minutes of this setting. Pressing **<home>** any time during the process will "lock in" your setting and bring you out to where the display shows the timer setting mode and the time set for that mode (timer setting mode "viewing only" level).

Example: If you had just set the first off time for the selections to be eight O'clock AM, the display would flash "SC-1" then "ON" then "08.00".

At this point, **<up>** or **<down>** will allow you to access all timer setting modes listed earlier. From this timer setting mode "viewing only" level, pressing **<home>** again will return you to the day of the week level. Press **<home>** again to return to the display of "daY". From "day" pressing select button #3 will take you to "StOP" and pressing select button #2 will take you to "dSP" (10.02) or "dSPt" (10.03 and greater).

Notes:

1. If you are setting certain selections to go off and come back on at a programmed time, you must first enter "SC-1 On" to set the first off time for selections. When done programming the first off time you must then program the first return on time for the selections by entering into "SC-1 Off" and programming your "return on" time.

2. For the timer to be able to control the selections you must set the selections to be controlled in the "StCL" mode of the password protected menu.

 DISPLAY TIME (**10.02 and lesser revisions)**

 DISPLAY TIME (**10.03 and greater revisions)**

If **<enter>** is pressed at this display the controller will enter the display time setting mode and the display will show either "dSt" (10.02 and lesser revisions) or "dPt" (10.03 and greater revisions) and flash the current setting. Pressing **<up>** or **<down>** will allow you to change the flashing setting back and forth between 0 and 1.

Setting	Meaning
0	Off, will not show current time on L.E.D. during greeting
1	On, will show current time on L.E.D. during greeting

Pressing **<home>** anytime during the process will return you to the start of the display time mode and the display will show "dst" or "dSPt". From this point pressing select button #3 will take you to "daY" and pressing select button #2 will take you back to "yEAr" (10.02 and lesser revision) or "dSt" (10.03) / "dLSt" (10.04+).

 DAYLIGHT SAVINGS TIME (**10.03 revision only)**

 DAYLIGHT SAVINGS TIME (**10.04 and greater revisions only)**

This option allows for the automatic adjustment of daylight savings time. If enabled the time would automatically be adjusted forward one hour at 2:00 a.m. (2:02 a.m. at the latest) on the first Sunday of April, and similarly adjusted back one hour on the last Sunday of October.

If **<enter>** is pressed at this display the control board will enter the daylight savings time enable / disable mode and the display will show "dSt" and flash the current setting. Pressing **<up>** or **<down>** will allow you to change the flashing setting back and forth between "**0**" and "**1**".

Setting	Meaning
0	Off, daylight savings time disabled
1	On, daylight savings time enabled

Pressing **<home>** anytime during the process will return you to the start of the display time mode and the display will show "dSLt" or "dLSt". From this point, pressing select button #3 will take you to "dSP" (10.02) or "dSPt" (10.03+), pressing the **<down>** button will take you to the "dSPt" mode.

When completely finished with all "tinE functions", pressing **<home>** from the "tinE" functions menuwill return you to code level where the display shows "tinE" pressing select button #3 will take you to "StCL" and pressing select button #2 will take you to "FriG".

FriG REFRIGERATION PARAMETERS

Description: The "FriG" mode is used to program the cut in and cut out temperatures of the unit, allows you to show the current "inside cabinet" temperature on the L.E.D. during the greeting, change the temperature from Fahrenheit to Celsius and test any controlling relays in the vendor (evap. fan, refrigeration, ballast and heater). There is even a setting to disable the unit for safety reasons. In the "FriG" mode there are 6 different functions which are listed below with their meanings.

"FriG function"	Meaning	Display Example
Cuti	Set the cut in temperature	41F
Cuto	Set the cut out temperature	29F
dEG	*Set either Fahrenheit or Celsius	------
dsP	Show inside temperature on L.E.D.	------
FrG	Disables unit (safety feature)	------
rELY	Relay test mode	------

* Temperature calculations will automatically be done and your cut in and cut out settings will also be in the form of temperature reading (Fahrenheit or Celsius).

Operation: If **<enter>** is pressed when the display shows "FriG" the controller will enter the refrigeration parameters mode and the display will show "Cuti".

Pressing **<up>** or **<down>** will allow you cycle through all 6 "FriG functions".

Pressing **<home>** while the display is showing any of the earlier listed "FriG functions" will return you to code level where the display shows "FriG".

Cut In

If **<enter>** is pressed when the display shows "Cuti" the controller will enter the Cut In setting "FriG function" and the display will show the current Cut In temperature setting (factory setting: 41F). Pressing **<up>** or **<down>** will allow you to change the Cut In setting.

Range Fahrenheit	Range Celsius
39°F to 45°F	4°C to 7°C

Pressing **<home>** any time during the process will return you to the beginning of the "Cuti" "FriG function" where the display shows "Cuti". From "Cuto" pressing select button #3 will take you to "rELY" and pressing select button #2 will take you to "Cuto".

Cut Out

If **<enter>** is pressed when the display shows "Cuto" the controller will enter the Cut out setting "FriG function" and the display will show the current Cut out temperature setting (Factory setting: 29F). Pressing **<up>** or **<down>** will allow you to change the Cut out setting.

Range Fahrenheit	Range Celsius
24°F to 34°F	-4°C to 1°C

Pressing **<home>** any time during the process will return you to the beginning of the "Cuto" "FriG function" where the display shows "Cuto". From "Cuto" pressing select button #3 will take you to "Cuti" and pressing select button #2 will take you to "deG".

 Degrees

If **<enter>** is pressed when the display shows "dEG" the controller will enter the degree setting "FriG function" and the display will show "dEG" and then flash the current degree setting. Pressing **<up>** or **<down>** will allow you to change the current setting

Setting	Meaning
F	Fahrenheit (factory setting)
C	Celsius

Pressing **<home>** any time during the process will return you to the beginning of the "dEG" "FriG function" where the display shows "dEG". From "deG" pressing select button #3 will take you to "Cuto" and pressing select button #2 will take you to "dsP".

 Display Temperature

If **<enter>** is pressed when the display shows "dSP" the controller will enter the display temperature "FriG function" and the display will show "dSP" and then flash the current setting.

Setting	Meaning
0	Temp. will not be displayed on L.E.D. during greeting
1	Temp. will be displayed on L.E.D. during greeting

Pressing **<up>** or **<down>** will allow you to change the current setting

Pressing **<home>** any time during the process will return you to the beginning of the "dSP" "FriG function" where the display shows "dSP". From "dSP" pressing select button #3 will take you to "dEG" and pressing select button #2 will take you to "FrG".

 Unit Disable

If **<enter>** is pressed when the display shows "FrG" the controller will enter the Unit Disable "FriG function" and the display will show "FrG" and then flash the current setting.

Setting	Meaning
0	Unit will not operate regardless of any settings
1	Unit will operate as normal off the cut in / cut out settings

Pressing **<up>** or **<down>** will allow you to change the current setting.

Pressing **<home>** any time during the process will return you to the beginning of the "FrG" "FriG function" where the display shows "FrG". From "FrG" pressing select button #3 will take you to "dSP" and pressing select button #2 will take you to "rELY".

 Relay Test

If **<enter>** is pressed when the display shows "rELY" the controller will enter the "FriG function" to allow you to test the various vendor relays. The display will show "Fan" which is the test mode for the optional evaporator fan motor relay. Pressing **<up>** or **<down>** will allow you to cycle through each relay test mode available.

"rELY" test mode menu	Meaning
Fan	To test optional evaporator fan relay
LitE	To test optional ballast (lighting) relay
Htr	To test the optional heater kit relay
CnPr	To test the equipped refrigeration relay

If **<enter>** is pressed at any of the four relay test modes the display will flash the name of the relay and then flash "on". If the relay is currently off and you wish to enable it **<enter>** here. If not, pressing either **<up>** or **<down>** will allow the display to flash the name of the relay and then flash off. If the relay is currently on and you wish to test the circuit by turning it off **<enter>** here.

Pressing **<home>** from within any relay test mode (as if after a test), will allow you to return to the relay test mode menu where the display will show the name of the menu that you

were just in. Pressing **<home>** from a point on the relay test mode menu will return you to the beginning of the relay mode where the display shows "rELY".

Pressing **<home>** while the display is showing "rELY" will return you to code level where the display shows "FriG". From "FriG" pressing select button #3 will take you to "tinE" and pressing select button #2 will take you to "PAS".

PASS External Password

Description: With the "Merlin III" vendor you have the capability to access both overall and individual selection can counts externally. You will have the option to reset the individual can counts if desired. You will also be able to read vendor errors externally (errors can't be cleared externally). The "PAS" mode gives you the option to change the external password to use any of your select buttons in a 4-digit combination or you may decide it best to use the factory setting of **4 - 2 - 3 - 1**. If you do decide to set your own password and happen to forget it, just access this menu and the current password will be displayed.

Notes:

1. Password numbers for use range from 0 to 9.
2. If your vendor only has seven selections you cannot use 8 or 9 or 0 in your password or you wont be able to enter the password.
3. To disable the external password: Set one of the four digits to "0" or a selection that is not available.

Operation:

If **<enter>** is pressed when the display shows "PAS" the controller will enter the external password setting mode and the display will show the current external password with the first number of the four (to extreme left of display) flashing. Pressing **<up>** or **<down>** will allow you to change the flashing digit. If **<enter>** is pressed the second number from the left will start flashing. By doing this you will lock in any changes made to the first digit and you will now be able to change the second digit. Follow the same process for every digit. If the fourth digit is flashing and **<enter>** is pressed you will return to the first digit again. Pressing **<home>** any time during the process will lock in your setting and return you to the code level and the display will show "PAS". From "PAS" pressing select button #3 will take you to "FriG" and pressing select button #2 will take you to "Eror" (10.02) or "LAnG" (10.03+).

LANG INTERNATIONAL LANGUAGE (Revisions 10.03 and higher only)

Description: The "Merlin III" vendor gives you the opportunity to set an international language of English, French, Spanish, Hebrew or German to show "hold" and "sold out".

Operation: If **<enter>** is pressed when the display shows "LAnG" the controller will enter the International Language setting mode and the display will show the current language which is being used. Pressing **<up>** or **<down>** will allow you to change the language to one of the following:

ENGL English, FrEn French, SPAn Spanish, HEbr Hebrew, GEr German

Pressing **<home>** any time during the process will enter the language which is being displayed and return you to the code level and display will show "LAnG". From "LAnG" pressing select button #3 will take you to "PAS" and pressing select button #2 will take you to "Eror".

The following menus have been previously described in the service menu section starting on page 26 and are added onto the end of the password protected menu for your convenience.

Eror	CFG	tUbE	tESt	rEtn
ERRORS	COIN PAYOUT	COIN TUBE FILL	VEND TEST	RETURN

External Menu

This section completely outlines all external Menu modes, including a description and operation for each.

The external Menu was designed to give ready access to product vend counts, and vendor diagnostics. This may come in handy for a loader, service technician or even a third party operator to use which is not permitted to change vendor setup such as timer settings, space to sales or even prices. All of the vendor setup is done in the Password Protected Menu and cannot be accessed with the vendor's door closed in normal operation. The external password is established in the "PAS" mode of the password protected menu and is changeable (For info. refer to the "PAS" section of this manual). The external password is factory set at **4 - 2 - 3 - 1**. If the password is entered when the display is showing the greeting the display will show "SALE".

SALE SALE COUNTER

Description: The sale counter mode is the same counter that is accessed through the password protected menu. It will allow you to manually extract the amount of product dispensed through your vendor (up to 99,999,999). The sale counter mode consists of a total count which is non-resettable and individual counts per selection which are resettable, depending upon the proper configuration setting (see configurations). The counts may possibly be displayed in up to two sets of 4 digits. Examples for both total and individual counters are as follows:

1. If the total product vended was 5,678,910. Upon entering the sale mode the display would flash *"SALE"*, followed by *"567"*, followed by *"8910."*.
2. If the individual sale count for selection 1 was 678,910. Upon accessing the individual count for selection 1 the display would flash *"SL 1"*, followed by *"67"*, followed by *"8910."*.

Clearing Individual Counters: See "CLr"

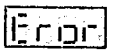
Operation: If **<enter>** is pressed when the display shows "SALE" the controller will enter the sales counter mode and the display will flash "SALE" then the total amount of sales made by the vendor, possibly in two sets of 4 digits as shown in example 1 above. Using **<up>** or **<down>** will cycle through individual sale counts for each selection and the display will flash individual counts as shown in example 2 above. If **<home>** is pressed anytime during this operation, the controller will return to the code level (display shows "SALE"). From "SALE" pressing select button #3 will take you to "Rtn" and pressing select button #2 will take you to "CLr" (only will appear if certain requirements are met. See CLr below).

CLr CLEAR

Description: This mode will allow you to reset (clear) your resettable individual product counters for each selection. The "Clr" mode will only appear if configuration 5 is set to "0" in the configurations mode of the password protected menu (see configurations "Con" described earlier in this manual) and if at least one individual counters has been read.

IMPORTANT NOTE: Doing this will reset both cash and sale individual counters which are within the password protected menu.

Operation: If **<enter>** is pressed when the display shows "Clr" the controller will enter the clear mode and automatically clear all individual product sale counters. The display will flash "Clrd" and then show "Eror". At this point the clear menu will be erased until a individual count is read again in the sale mode. From code level (display shows "CLr") pressing select button #3 from "Clr" will take you to "SALE" and pressing select button #2 will take you to "Eror".

 ERRORS

Description: This mode was designed to help diagnose vendor problems... Upon opening the vendor's main door, L.E.D. will flash any possible errors (For a list refer to Chapter 5 "Reading Error Codes"). If there are no errors the display will momentarily flash "none" and revert to the sales greeting (ICE COLD COCA COLA). This Errors Menu is designed to give you a detailed description of the Error as seen upon door opening.

Operation: If **<enter>** is pressed when the display shows "Eror" the controller will enter into the errors descriptive display mode. At this point, the display will show any and all current vendor errors first followed by the descriptive. If no errors exist "none" will appear on the display. If **<home>** is pressed anytime during this operation, the controller will return to the beginning code level (display shows "Eror"). From "Eror" pressing select button #3 will take you to "SALE" or "CLr" and pressing select button #2 will take you to "rtn".

Note: Errors cannot be cleared in the external "Eror" mode but only in the "Eror" mode within the service or password protected menus.

 RETURN

By pressing the control boards mode button, the display will show "rtn". If **<enter>** is pressed when the display shows "rtn" the controller will revert to a sales mode and the greeting will be displayed. From "rtn" pressing select button #3 will take you to "Eror" and pressing select button #2 will take you to "SALE".

Programming Quick Set-up

This following section was designed to give you an idea of where to start as you begin to program your vendor for the first time. As you gain more experience programming your Merlin III vendor you may find faster and better ways of programming. Before you start to program it is always best to have an idea of how you want to set your vendor. Ask yourself the following questions.

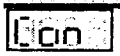
1. How many selections will I use? (How many flavors do I want?) The more flavors, the more you cut down the capacity per flavor.
2. Of the columns inside my vendor, what flavors do I want to load in what columns? Make good use of the wide and narrow columns to maximize space to sales.
3. Do I want to go with a custom space to sales setting or a quick "factory set" similar button to column configurations, as conventional electro-mechanical (regular) vendors from the past?
4. Is the vendor going to be set for single or multi-pricing?
5. What is the vend price or prices?
6. Check my configurations list for any options that I may wish to use. (Refer to configurations, starting on page 31. List of, on page 32) Also at this time I must decide if I want to use the vendor's "built in timer" to turn off/on selections etc.
7. Lastly, I must check the vendor's depth and double column settings to assure that they're set properly to avoid multiple vending. After answering all the questions you are ready to research in the manual and access the modes to set your vendor up.

Follow this order to help avoid problems during setup.

Access the configuration mode described starting on page 31. To get to the "Con" mode first open the vendor's main door then press the controller's mode button. The display should show "Eror".

You must enter the password protected menu to get to "Con". Do this by:

- press select button #3 (the display should show "PASS")
- press select buttons #4 (the display should go blank) then #2 then #3 then #1.
- press select button #4 (ENTER)

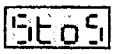


The display should now show "CASH" and you will be at the beginning of the password protected menu.

- press select button #2 four times, the display should change to a different mode each time.

The display should now show "Con" and you will be at the configurations mode. Follow the instructions starting on page 31 to set the configurations. make sure to check each configuration to make sure each one is set appropriately.

IMPORTANT NOTE: when finished in "Con" you must come back out of the mode (by pressing button #1) to where the display shows "Con" for the following procedures to be effective.



The next step to setting your vendor up is to set the space to sales. To get to the space to sales mode from configurations mode where the display shows "Con":

- press select button #3 (the display should show "StoS")

You are now at the space to sales mode. Follow the instructions on page 30 to set your space to sales.

IMPORTANT NOTE: when finished in "StoS" you must come back out of the mode (by pressing button #1) to where the display shows "StoS" for the following procedures to be effective.

The last step to quick vendor set up is to set the pricing. To get to the pricing mode from where the display shows "StoS":

- press select button #3 (the display should show "Pric").

You are now at the set price mode. Follow the instructions on page 29 to set your vend price (s).

Chapter 4

Vend Cycle

Vend Sequence

In a "stand-by" condition the vendor will show the greeting and possibly the vend price (if set for a single price) and a choice of other optional features on the L.E.D. display. If a select button is pressed prior to reaching the vend price (establishing a credit), the display will show the vend price for that selection. This will indicate to the customer that more money is needed for that particular selection.

As coins are inserted into the coin mechanism, a corresponding credit count will appear on the display. The coin mechanism will continue to accept coins until the highest vend price has been achieved, all coins in excess of the vend price will be returned to the coin cup. Once the vend price has been achieved, the control board will then set up a credit, enabling a vend to be made for any selection which is equal to or less than the established credit.

The vendor's control board constantly sends a logic level signal to the common position of each select switch. When a selection is made, the selection switch closes, allowing the low voltage signal to travel from the switches common position through the switch and out the normally open position of that switch to the control board. At this time, (if there has not been a previous sold out) the control board distributes 110 volts through the door and cabinet wiring harnesses and directly to the coil of the chosen vend motor. Simultaneously "hold" will appear on the display, this is a indication to the customer that a vend is in progress and to please wait. As the vend motor receives power, it will cycle the oscillator or rotor in attempt to vend a can. At this point one of two things will take place:

1. The column selected will register "sold-out" (see "sold out" this section)

OR

2. The control board will continue to send 110 volts, as the vend motor cycles, it will turn the oscillator or rotor to dispense product.

Note: Most "RVCCE" models have "sold out paddles" on each column. For a vend motor to operate, the sold out paddle for that attempted column must be pressed down.

As the can or bottle drops onto the product delivery chute, the vibration from the impact will allow the delivery sensor to send a low voltage signal, to the vendor's control board indicating that a product has been vended.

After the control board receives the sensors signal, it will take into account how the vendor is programmed (set depth and the options) and it will act accordingly:

1. If the front can (either front or middle can in a triple deep vendor) has just vended, the control board will kill all power to the vend motor at the exact same time which an impact is registered (to avoid a multiple vend of the next product to the rear of the cabinet).

OR

2. If the rear can has just vended, the control board will cycle the vend motor to pick up another load of product to allow a quick vend (less than 2 seconds) for the next customer.

Note: The controller will go through a learning process known as the "learning mode", it will occur either on power down/up or a door opening/closing. It is what allows the vendor's controller to decide which is the front (middle in triple deep) or rear product. The learning mode acts in conjunction with the depth setting to allow for a automatic reload after the rear can has vended. How it works: The controller will notice the first "long-timed out" vend cycle (during the learning process) and from this, the controller will know that the very next vend will be the front product.

Sold Out Condition

Upon selection the display will read "Hold". After 10 -12 seconds, if a drop of product is not detected the display will show "sold-out". A sold out may be due to:

- The column attempted is jammed, therefore product does not drop.
- The column attempted is genuinely sold out (empty) of product.
- The sensor is out of adjustment and does not detect the product drop (see section 3: vendor set-up).

The digital display will indicate "sold out" and flash the sold out lamp, signaling to the customer to make another selection, or push the coin return lever for a full refund (if set for escrow to vend). If set for forced purchase the customer must make a selection.

If the vendor is totally sold out of product, illumination of the "sold out" lamp and the "sold out" message on the digital display will be continuous. No money will be accepted into the vendor in a total sold out condition.

A sold-out condition is only cleared by the vendor's door switch through opening and closing the vendor's main door.

If a sold out condition is not cleared, the controller will not attempt to vend from that selection (the display will not show "Hold") and it will automatically show "sold-out" upon pressing the select button (either before or after reaching a vend price).

Note: In most models when a column is in the sold out condition, sold out paddles enable the vendor to keep two or more (depending on the load) in the pre-cool position in double depth vendors, while keeping three or more cans in the pre-cool position in triple depth cabinets.

Chapter 5

Vendor Maintenance

Taking Care of your Vendor

What to clean

A routine cleaning schedule is the best way to insure the best possible operation and appearance from your Merlin III vendor.

Control board: The vendor's control board should always be enclosed inside of its cover to help protect it. Routine cleaning is not necessary but if desired the controllers area may be blown out with compressed air.

Never use petroleum cleaners and *Never* submerge electronics in water. If the controller is accidentally sprayed with water, be sure to allow it to dry thoroughly before powering the vendor up.

Condenser and Evaporator Coils: For efficient operation, the condenser and evaporator coils must be kept clear of any dirt or foreign materials. Clean dirt and lint from the condenser and evaporator coils with a brush, vacuum cleaner or compressed air.

Cabinet and Mechanism: Steam clean as required. *Never* use petroleum cleaners and *Never* submerge electronics in water..

What to Lubricate

Latch Strike Nut: The latch strike nut should be lubricated from time to time with a petroleum base grease.

Inner Door Gasket: The door gasket comes from the factory pre-lubricated but should be lubricated from time to time with a silicone base grease. Apply to the vertical piece of gasket, on the hinged side of the inner door, that touches the vendor's main door. This will help prevent any "peel back" of the gasket which could possibly cause air leaks into the sealed cabinet resulting in freeze ups.

Refrigeration System: The refrigeration system is a sealed unit and does not require any lubrication. The condenser and evaporator motors do not require any lubrication.

Safety Note:

To prevent bodily injury or damaging the electronics never plug or unplug any electrical connectors with power applied.

Reading Error Codes

Upon opening the vendor's main door the L.E.D. display will enter the service mode and either show you any vendor errors or flash "none" then revert to the greeting. If any errors are displayed you can access the errors mode and read the detailed description for all errors. Following is a list of all error codes and their descriptions.

ERROR	DETAILED ERROR CODES	CORRECTIVE ACTION
Door Switch Circuit		
"door"	door (door open for 1 hour)	Check door switch and harness
Select Switches		
"SELS"	SS 1 (Sel. Switch 1 is closed)	Check Button, Replace Switch
	SS 2 (Sel. Switch 2 is closed)	Check Button, Replace Switch
	SS 3 (Sel. Switch 3 is closed)	Check Button, Replace Switch
	SS 4 (Sel. Switch 4 is closed)	Check Button, Replace Switch
	SS 5 (Sel. Switch 5 is closed)	Check Button, Replace Switch
	SS 6 (Sel. Switch 6 is closed)	Check Button, Replace Switch
	SS 7 (Sel. Switch 7 is closed)	Check Button, Replace Switch
	SS 8 (Sel. Switch 8 is closed)	Check Button, Replace Switch
	SS 9 (Sel. Switch 9 is closed)	Check Button, Replace Switch
	SS 10 (Sel. Switch 10 is closed)	Check Button, Replace Switch
Changer		
"CHAr"	CC (Changer Communication)	Check all changer connections. Replace changer or controller if necessary.
	TS (Changer Tube Sensor)	Consult changer manufacturer
	IC (Inlet Chute Blocked)	Clear Inlet Chute
	tJ (Changer Tube Jam)	Clear Changer Tube Jam
	CrCh(Changer ROM Checksum)	Consult changer manufacturer
Acceptor		
"ACCE"	EE (Excessive Escrow)	Excessive escrow attempts in a one minute period
	nJ (Acceptor Coin Jam)	Clear Jam
	LA (Low Acceptance Rate)	Consult changer manufacturer
Delivery Chute Sensor		
"Chut"	Chut (Chute sensor always on)	Chute Sensor is set too sensitive and picking up noise. Replace sensor if necessary
Space to Sales		
"StS"	DAxx (Double Assigned Col's)	Correct space to sales settings
	UAxx (Unassigned columns)	Correct space to sales settings
Bill Validator		
"bUAL"	bS (Bill Sensor Error)	Remove obstruction or replace Bill Validator
	bILL (Bill Motor Error)	Contact Validator manufacturer
	bJ (Bill Jam)	Remove jammed bill or replace Bill Validator
	bOPn (Bill Cash Box Open)	Close bill acceptor cash box

	bFUL (Bill Cash Box Full)	Remove bills from cash box
	bC (Val. communications)	Check all validator connections. Replace validator or controller if necessary

Refrigeration System

"FriG"	SEnS (Temperature Sensor)	Check temperature sensor. Change if necessary
	CoLd (Sensing temperatures 3 degrees below cutout)	Check Refrigeration Relay
	CnPr (Not cooling within 30 minutes of cut in)	Check Refrigeration Relay
	ACLo (Less that 95 volts for greater than 30 min.)	Check voltage at the outlet.

Troubleshooting

Your "Merlin III" vendor is equipped with error code diagnostics to aid in repair and maintenance of your vendor. The following section is to help trouble shoot the following problems:

Acceptance Problems (Coin Changer, Bill Validator)
Multiple or Dry Vending Problems
Miscellaneous Problems
Refrigeration Problems

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
No coin acceptance	No power to controller (display is dead)	Check power connection at controller (24VA)	If no power, check/replace transformer
	coin mechanism harness to board is cut or disconnected	Check each harness wire to make sure it is not cut /disconnected.	repair or replace changer harness
	Short in changer	Unplug all harnessing from control board but Positions J1, J11 and J3... Try coin acceptance... If still no acceptance...	Try new coin mechanism with only J1, J11 and J3 plugged in...
	Short in control board	If still no coin acceptance	Replace vendor's control board
No acceptance or rejects a percentage of good coins	Coin return lever	Make sure changer is mounted correctly & coin return lever is in proper position	Reposition changer and or vendor coin return lever.
	Acceptor is dirty or foreign matter in path	check acceptor path to be clean	clean acceptor

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
	coin changer improperly tuned (if tunable)	Consult coin changer manual/ representative or replace changer	Consult coin changer manual / representative or replace changer
	Defective controller (no acceptance only)	Replace control board and test	Replace faulty control board
Accepts coins but gives erratic / no credit	*If erratic or no credit:* acceptor (coin mech)	Replace coin mech. (acceptor) and test. if OK	Replace acceptor or coin mechanism
	If no credit: Defective harness between coin mechanism and control board	Check harness for cut wires or wrong connections. If defective	Repair or replace harness
	If no credit: Defective controller	Replace control board and test	Replace faulty control board
Changer will not payout coins	Defective harness between coin mechanism and control board	Check harness for cuts or wrong connections	Repair or replace harness
	Defective coin mechanism	Replace coin mechanism and test. If it pays out.	Replace faulty coin mechanism
	Defective controller	Test vendor's manual coin payout... If vendor pays out manually by not during sales...	replace defective control board
Validator will not pull in a bill	No power to validator (validator status light is off)	Make sure that the validator harnessing is correct for your style of validator and it is plugged in properly.	Correct faulty harnessing. Power vendor down/up and listen for validator to cycle... If validator cycles, power is present.
	Acceptance disabled by coin mechanism or bad harnessing (validator status light is on)	Make sure that the coin mechanism is plugged in (accepts coins) and that the tubes are full of coins.	If not, fill coin tubes.
		Make sure that the changer harnessing is correctly connected. if so	Repair or replace faulty harnessing
		Replace coin mechanism and test. If validator accepts...	replace defective coin mechanism
	Defective validator	Replace validator and test. If validator accepts...	Replace defective validator

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
	Defective controller	Replace controller and test. If validator accepts...	Replace defective controller
Validator takes a bill and not establishing a credit	Defective (wrong, cut or miswired) validator harnessing. (Credit not getting from validator to control board via the credit wire)	Make sure that the validator harnessing is correct for your style of validator and it is plugged in / wired properly.	correct faulty harnessing
	Defective validator	Replace validator and test. If validator accepts...	Replace defective validator
	Defective controller	Replace controller and test. If validator accepts...	Replace defective controller
Validator takes a bill and not erasing credit	Validator switch settings (if any)	Refer to validator service manual or validator representative	----------
	Defective validator interface harness	Refer to validator service manual or validator representative	----------
	Defective validator	Replace validator and test. If validator accepts...	Replace defective validator
	Defective controller	Replace controller and test. If validator accepts...	Replace defective controller
Validator takes a bill and allows payback of coins without a selection	Controllers options settings not correct.	Access the vendor's options mode and check the option settings (refer to section 3 "vendor setup")	change options if incorrectly set, then test.
Multiple vending	controllers column depth setting "SdEP" per column is wrong	Access the vendor's set depth mode and check the current depth setting. If wrong.	Correct setting
	Controllers double column ("dubc") setting is wrong	Access the vendor's "dubc" mode and check the current option #1 select button setting. If wrong.	Correct setting

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
	Delivery sensor	check to see if the delivery sensor is plugged onto the controller. If not...	Plug sensor harness onto proper connection at the controller and properly grounded.
		Check to ensure that the sensor is adjusted properly. Test by hitting delivery chute to watch the sensor adjustment blink on then off.	Adjust sensor properly if necessary
		replace delivery sensor and test. If it vends correctly	Replace defective sensor
	Vend motor	Check to see if the vend motors brake is not bent and that it is releasing after a vend cycle. If not	lubricate vend motor brake with silicone spray
			Check vend motors brake pawl spring... If bad, replace motor
	Vend mechanism (Oscillator & Rotor)	Make sure that the oscillator (wide column) and rotor (narr. column) are properly in place and that they are not bent in the slightest. If so	Replace defective part(s)
	Shimming if necessary (or required in triple deep cabinets)	Make sure that the proper shimming is installed for your type of vendor according to the product that you are vending.	Install proper shimming if necessary
Multi-vend or double vend every other attempt	Vendor Vending depth set incorrectly (may be set for less than actual depth)	Access controllers set vend. depth mode ("SdEP") and check all selections. If incorrect...	Correct depth setting
	Vendor double columns ("dubc") set incorrectly (number of wide columns)	Access controllers "dubc" mode and check the options	Correct double columns setting

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
	Delivery sensor	Check to see if the delivery sensor adjustment L.E.D. blinks upon product impacting the chute. If not...	Turn sensor adjustment screw 1/4 turn clockwise and test vend. If still not working, turn clockwise until adjustment L.E.D. lights and test vend.
Wrong product vending from selection #1 every second vend.	Vendor space to sales set incorrectly (is allowing sequencing)	Access controllers "StoS" mode and check the current settings: 10.02 or less: check it in "CStS" 10.03 and greater: check it when entering "StoS"	Correct "StoS" settings
Multiple vends without a selection	Reversed polarity with a wire shorted to ground between the control board and the vend motor	During standby. If 110 volts is read on the neutral side of the vend motors. (jumper or sold out switches side)	Check the voltage from the wall outlet if it is reversed, try to find the shorted wire from the select switch to the vend motor.
	Defective control board	During standby. If 110 volts is read at any motor from the board. (Check every vend motor)	Replace controller and any shorted vend motors. If a shorted motor is missed there will be a change of a reoccurrence
First vend after reload is slower than 3 seconds	Vendor vending Depth set incorrectly (set for greater than actual depth)	Access controllers set depth mode and check all selections. If incorrect...	Correct depth setting
No vend upon selection - Dry vend (no refund)	Delivery sensor	Check to see if the delivery sensor adjustment led is constantly on, If so.	Turn the adjustment screw counter clockwise until adjustment led goes out.
		Check to see if the delivery sensor harness is cut or pinched. (The sensor adjustment led will constantly be on.). If a cut is found.	Replace defective sensor
		Unplug the sensors connection from the control board. If the adjustment led stays on	Replace defective controller

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
No vend from some but not all columns (allows refund or 2nd choice)	Selection switch	Make sure that the L.E.D. display acknowledges the selection switch pressed by displaying "hold" or by showing "sold out" If not...	Check the select switch... And trace the selections harness back to the control board... replace if necessary
	Individual wire that runs from the motor connection of the control board to the vend motor of the defective column	Check individual wire running from motor connection at board to defective column. If cut or pinched	Repair or reposition the wire if necessary.
	Neutral wire jumping from left to right (inside cabinet) to each vend motor is cut or pinched	If this wire is cut or pinched all vend motors to the right of the problem will not run	Find and repair the cut / pinched wire
	Control board	Measure voltage at motors connect. on the individual wire per attempted motor. A selection must be made and "hold" must be displayed on the L.E.D. You should register 110 VAC	If no or insufficient voltage is registered change defective control board.
No vend from any selection (allows refund or 2nd choice)	Vend motors fuse blown by shorted control board.	Unplug vend motors connect. from control board. Replace fuse and power up, check fuse	If blown, replace control board
	Vend motors fuse. blown by shorted harnessing...(after performing the above test)	With motors conn. plugged onto controller unplug leads from each motor. Replace fuse, vend from each column then check fuse. If bad	Repair or replace shorted harnessing between control board and motors

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
	Vend motors fuse. blown by shorted vend motor(s)...(after performing the above test)	With motors conn. plugged onto controller & leads plugged onto each motor. Replace fuse & vend from each column. If fuse blows	Repair or replace shorted harnessing between control board and motors
	Wire 36 to vend motors connection does not have at least 110 volts AC constantly	Check all wires connected to wire 36 from the control board for cuts... Cut found ?	If so, repair or replace shorted harnessing carrying 110 VAC to control board
	Neutral wire jumping from left to right (inside cabinet) to each vend motor is cut or pinched	If this wire is cut or pinched all vend motors to the right of the problem will not run	Find and repair the cut / pinched wire
No vend from any selection (allows refund or 2nd choice)	Vend motors fuse blown by shorted control board.	Unplug vend motors connect. from control board. Replace fuse and power up, see if fuse blows.	If so, replace control board
L.E.D. not lit	No power to control board	Check for 24 volts AC at the control boards power connection. If no power.	Check transformer and power to transformer
		Press controllers mode button. Does L.E.D. light? Power the vendor down & up. Does L.E.D. light?	If not, check L.E.D. lead
	L.E.D. lead	Check the lead for any sign of being pinched or cut. If so...	Replace L.E.D. lead
	L.E.D	Change the L.E.D., Remove all harnessing but L.E.D. lead & power lead from transformer to board. Check the new L.E.D. before mounting. If still bad	Replace the control board and test.

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
Vendor set at a single price & display shows	Vendor double columns "dubc" set incorrectly (number of total columns)	Access "dubc" mode and check the options (especially for total number of columns)	Correct double columns setting
Display shows sold out immediately upon pressing select button with column full of product (sold-out not clearing)	Door switch wiring incorrectly connected or cut / pinched	Check For cuts on the (2) door switch wires `going from the switch to the control board, Also check for bad connections: • At the door switch • The plug at the bottom of the vendor's main door • At the control board connection. Are any found?	If not, Check the door switch
	Door switch	Check the door switch to see if it's defective, If so	Replace door switch and test
	Control board	Check control board by shorting across the two pins for the door switch wiring (control boards option connection) Does this clear the sold out condition?	If so, replace control board

Refrigeration unit runs constantly	Cut out temp. not set properly	Check cut out setting in the "FriG" mode	Correct if necessary
	Temperature sensor not reading correctly	Test the temp. sensor by showing the temp. on the display and measuring the actual inside cabinet temp. with a thermometer or by opening/closing door to see if the temperature changes	If defective, replace temperature sensor
	Short in wiring harness from controller to refrigeration relay	unplug one of the two "pink" connector wires coming from the board to power the relay. if the unit cuts off	Locate the shorted wire to be either on the door side or the cabinet side of the harness and correct or replace defective harness.

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
	Refrigeration relay contacts welded together	Unplug one of the two "pink" connector wires coming from the board to power the relay. if the unit continues to run...	Switch the two "blue connector" wires coming from the main wiring harness to the two other available connectors if present. If not, replace relay.
Refrigeration unit will not run	Unit itself is defective	Unplug the refrigeration unit from the top of the main wiring harness and plug it into a direct power source	If it does not run... replace the refrigeration unit.
	"FrG" setting not set properly	Check "FrG" setting in the "FriG" mode to make sure it is set to 1.	If set incorrectly, reprogram it to show 1
	Cut in / Cut out settings not set properly	Check cut in /cut out settings.	If set incorrectly, reprogram them.
	Temperature sensor not reading correctly	Test the temp. sensor by showing the temp. on the display and measuring the actual inside cabinet temp. with a thermometer or by opening/closing door to see if the temperature changes	If defective, replace temperature sensor
	Short in wiring harness from controller to refrigeration relay	Unplug the two "pink" connector wires coming from the board and measure voltage. You should read approx. 24 volts DC from one of the wires.	If not. Locate the shorted wire to be either on the door side or the cabinet side of the harness and correct or replace defective harness.

TROUBLE	POSSIBLE CAUSE	PROCEDURE	REMEDY
	Refrigeration relay is defective	Test the relay by making sure all connections are made for the refrigeration unit, the refrigeration relay and the board. Next go into the "FriG" mode and is the compressor by pressing <enter> when you get to "cnPr" and pressing <enter> again when the display flashes "cnPr" and "On".	

Chapter 6

Exploded Views and Parts Numbers

Miscellaneous Assemblies

Port Assembly
Inner Door Assembly
Main Door Hinge, T-handle & Door Lifter Assemblies
Control Board & Wiring, MIII

Miscellaneous Assemblies

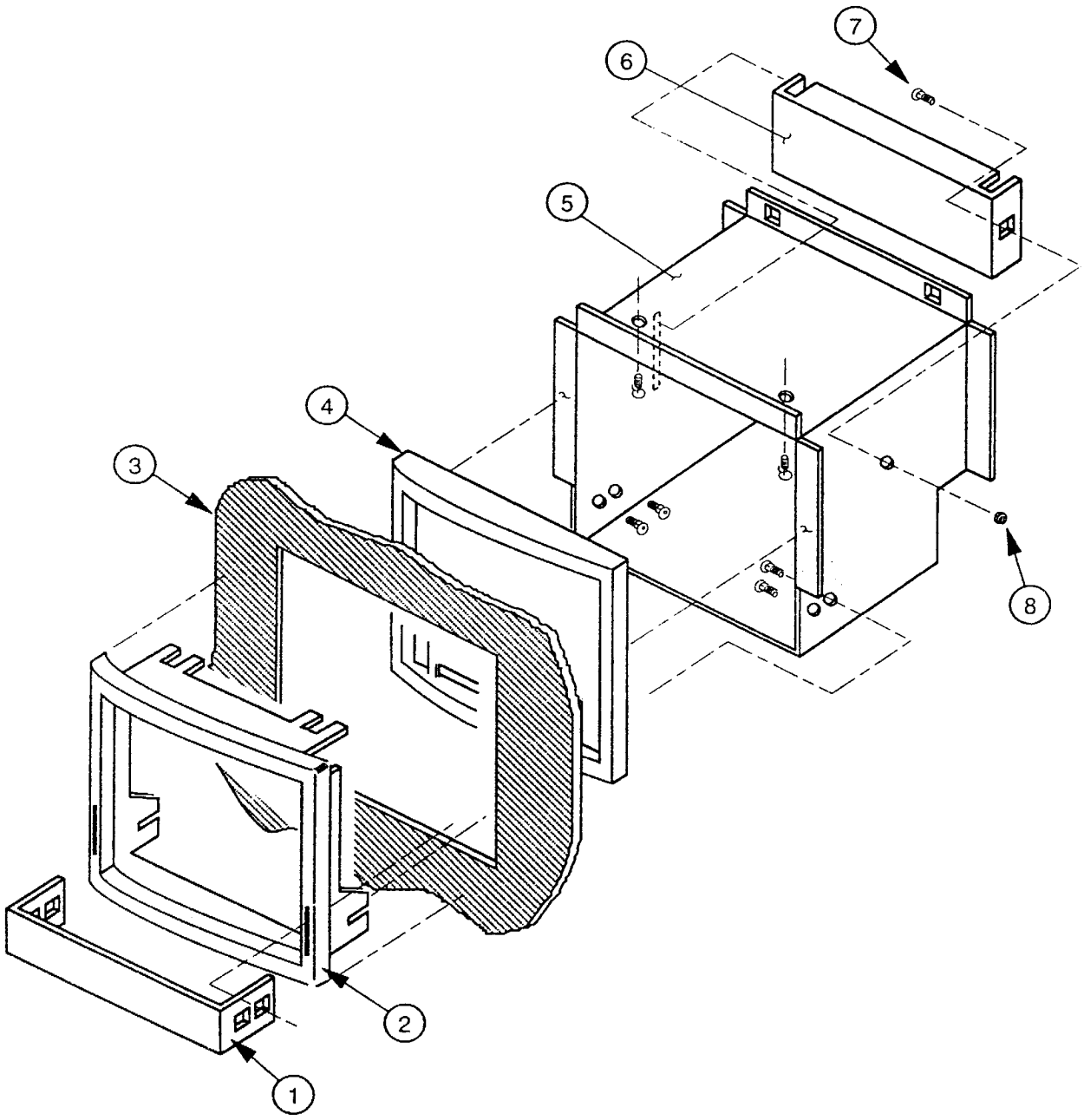
Cabinet, Refrigeration Assembly
Cabinet, Stack / Vend Mechanism Assemblies

Door Assemblies

Main Door, Front (details trim)
Main Door Rear (details misc. door parts)
Vandal Resistant Door, Front (details coin insert)
Vandal Resistant Door, Rear (details control panel)
"Tuff Guy" Vandal Resistant Door Parts
Center Changer Door Assembly
"Tuff Guy" Center Changer Door Parts

Miscellaneous Assemblies

PORT ASSEMBLY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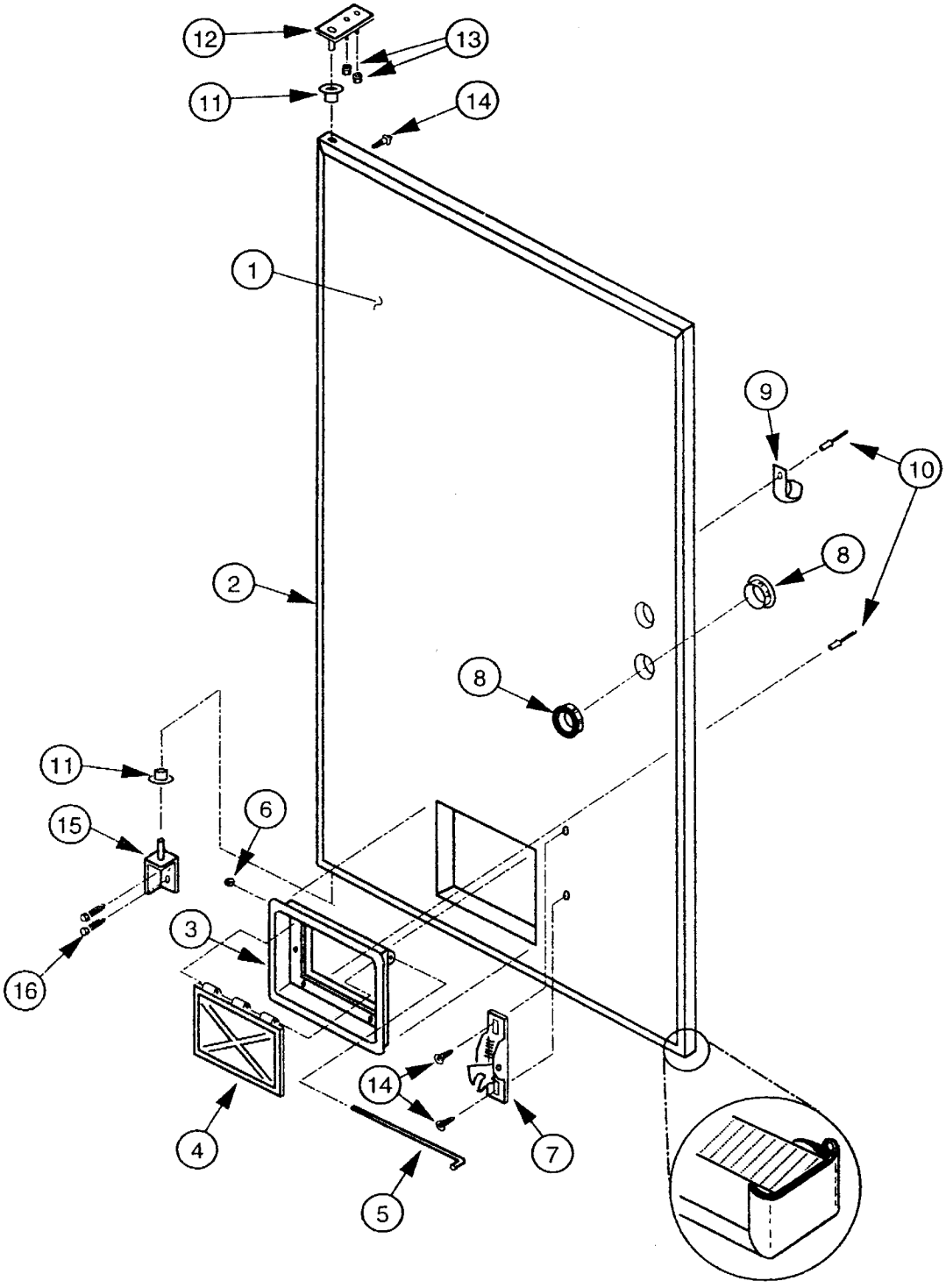
PORT ASSEMBLY		
ITEM #	DESCRIPTION	PART NUMBER
1	Can Stop	010,508,003
2	Port Trim	815,019,001
3	Sign	SEE NOTE #1
4	Port Spacer	815,020,001
5	Port Body W/A	010,530,003
6	Anti Theft Plate (all except 16oz & C.D.C. Vend.)	010,509,003
	Anti Theft Plate (Bottles)	141,102,003
7	Bolt 1/4-20x1/2"	901,007,001
8	Nut 1/4-20	905,002,001
NOTE #1:	There are various parts, please specify model and serial number at the time of order	

Miscellaneous Assemblies

INNER DOOR ASSEMBLY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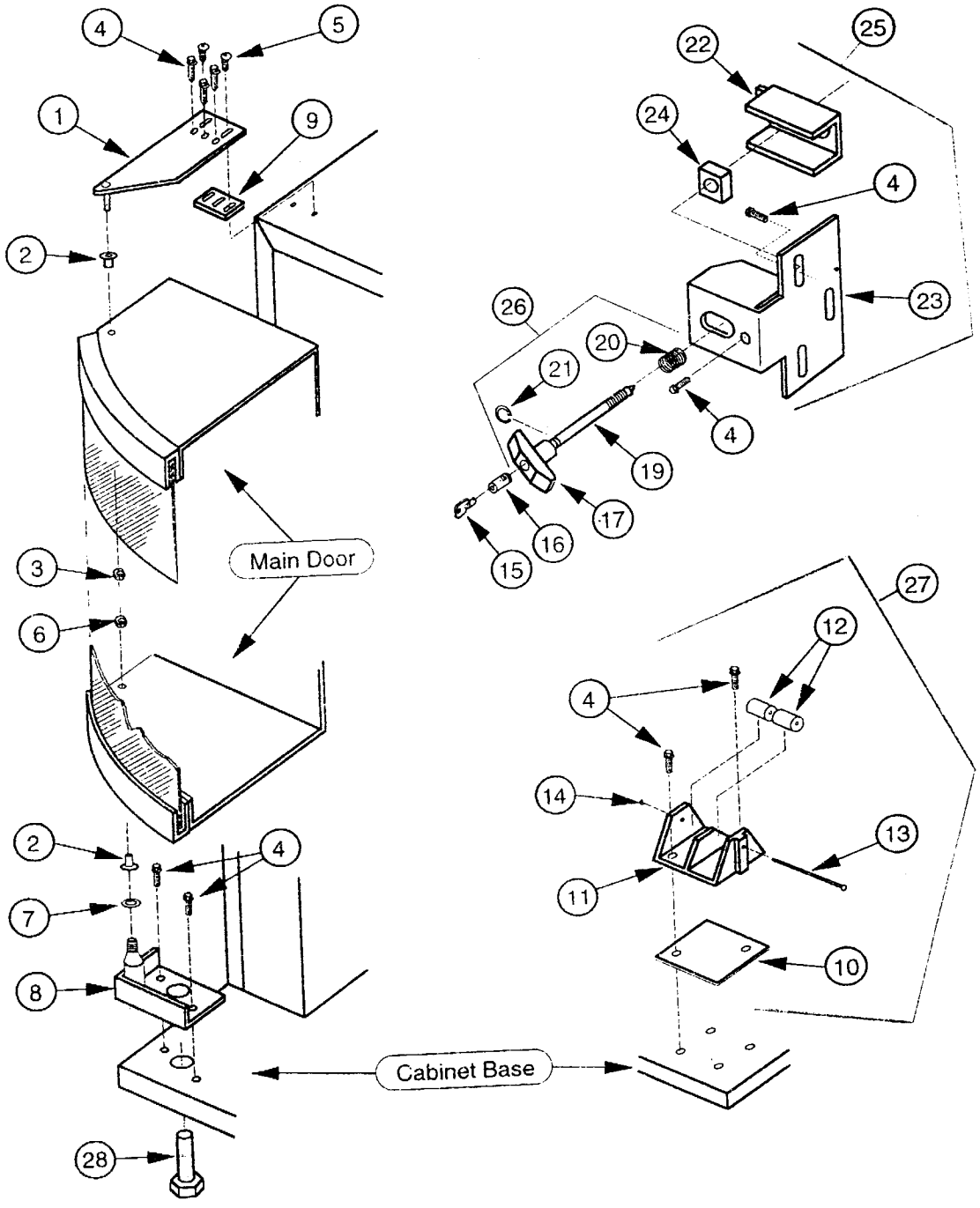
INNER DOOR ASSEMBLY		
ITEM #	DESCRIPTION	PART NUMBER
1	Inner Door Ass'y 72"	011,620,004
	Inner Door Ass'y 79"	010,620,004
2	Inner Door Gasket 72", Wide	815,032,001
	Inner Door Gasket 79"	815,033,001
3	Port Door Frame	815,013,001
4	Port Door	815,014,001
5	Port Door Rod	811,004,001
6	Elastic Stop Nut #6-32	905,006,001
7	Latch Strike (For Inner Door)	812,003,001
8	Bushing, 1.37"	916,003,001
9	Cable Clamp 1"	916,004,001
10	Rivet 3/16" dia.	908,002,001
11	Inner Door Bushing	815,026,001
12	Inner Door Hinge	010,520,004
13	Nut #8-32	905,001,001
14	Self-drilling Screw #8-18x1/2"	010,543,003
15	Bottom Door Hinge	010,543,003
16	Bolt 1/4-20x1"	901,003,001

Miscellaneous Assemblies

MAIN DOOR HINGE, T-HANDLE & DOOR LIFTER ASSEMBLIES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Main Door
Cabinet Base
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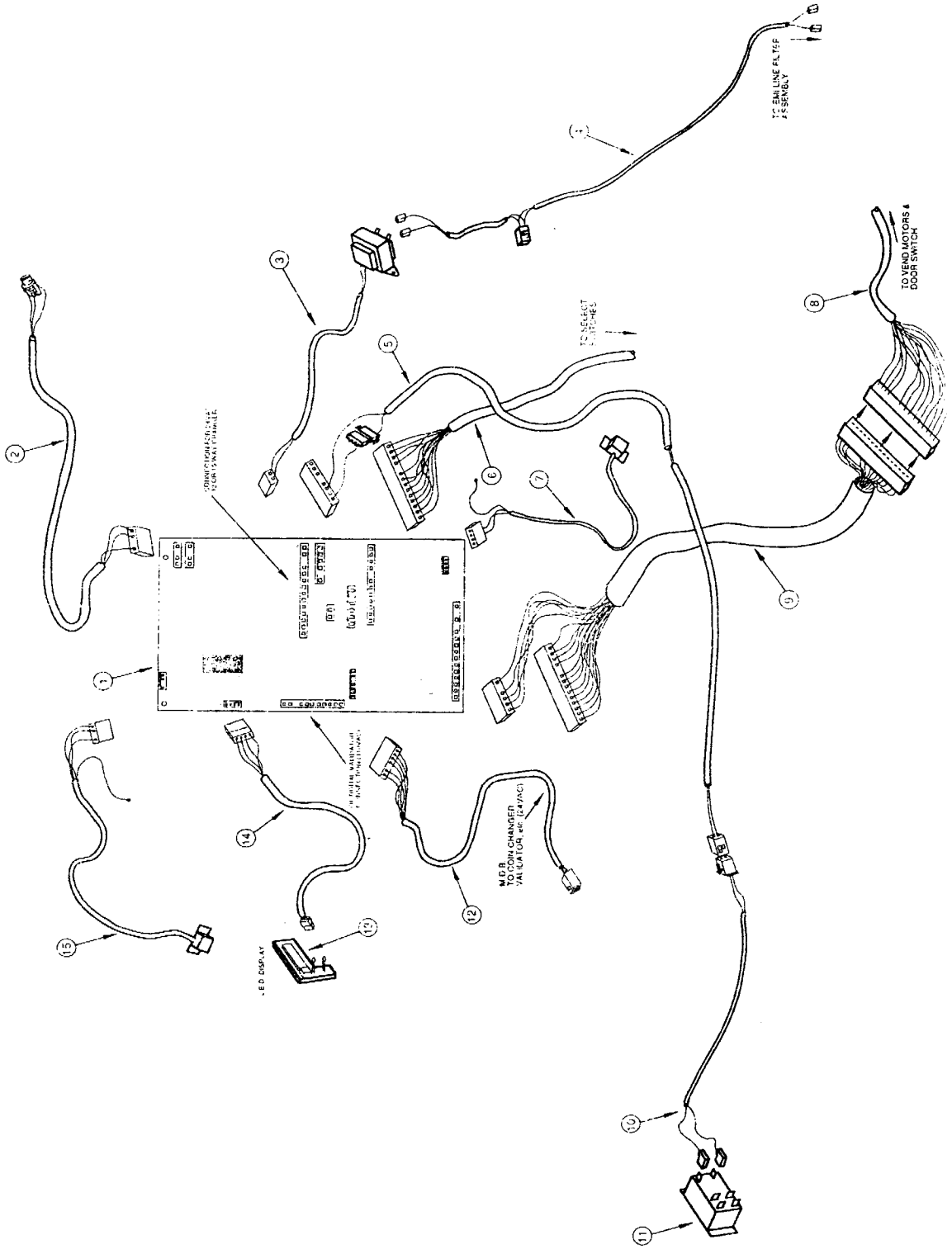
MAIN DOOR HINGE, LIFTER & T-HANDLE ASSEMBLY		
ITEM #	DESCRIPTION	PART NUMBER
1	Top Hinge Assembly	810,002,001
2	Bearing Nyliner 1/2	916,012,001
3	Nut 5/8"	905,007,001
4	Self Tapping Bolt 1/4-20x1"	901,003,001
5	Carriage Bolt 1/4-20x1"	901,008,001
6	Nut 1/4-20	905,002,001
7	Flat Washer 7/8 O.D.	904,002,001
8	Bottom Hinge Assembly	010,040,003
9	Top Hinge Spacer	010,016,003
10	Door Roller Spacer (As required)	010,015,003
11	Door Roller Bracket	SEE NOTE #2
12	Door Roller	SEE NOTE #2
13	Door Roller Pin	SEE NOTE #2
14	Retaining Ring 5/32"	906,005,001
15	Key	SEE NOTE #1
16	Lock	SEE NOTE #1
17	T-Handle Body (All Except Vandal Resist. Door)	812,134,001
18	Pin, T-Handle	912,133,001
19	T-Handle Stud	803,006,001
20	Spring	SEE NOTE #2
21	Retainer Ring	SEE NOTE #2
22	Nut Retainer	010,028,003
23	Latch Strike	010,027,003
24	Square Nut 3/4x1/2-13	905,005,001
25	Latch Strike Assembly	010,030,004
26	T-Handle Assembly	812,001,001
	T-Handle Assembly (All Vandal Resistant Doors)	812,176,001
27	Door Lifter Assembly	815,030,001
28	Leveling Leg	803,002,001
NOTE #1:	There are various parts, please specify model and serial number at the time of order	
NOTE #2:	This part is not available individually. It must be ordered as an assembly.	

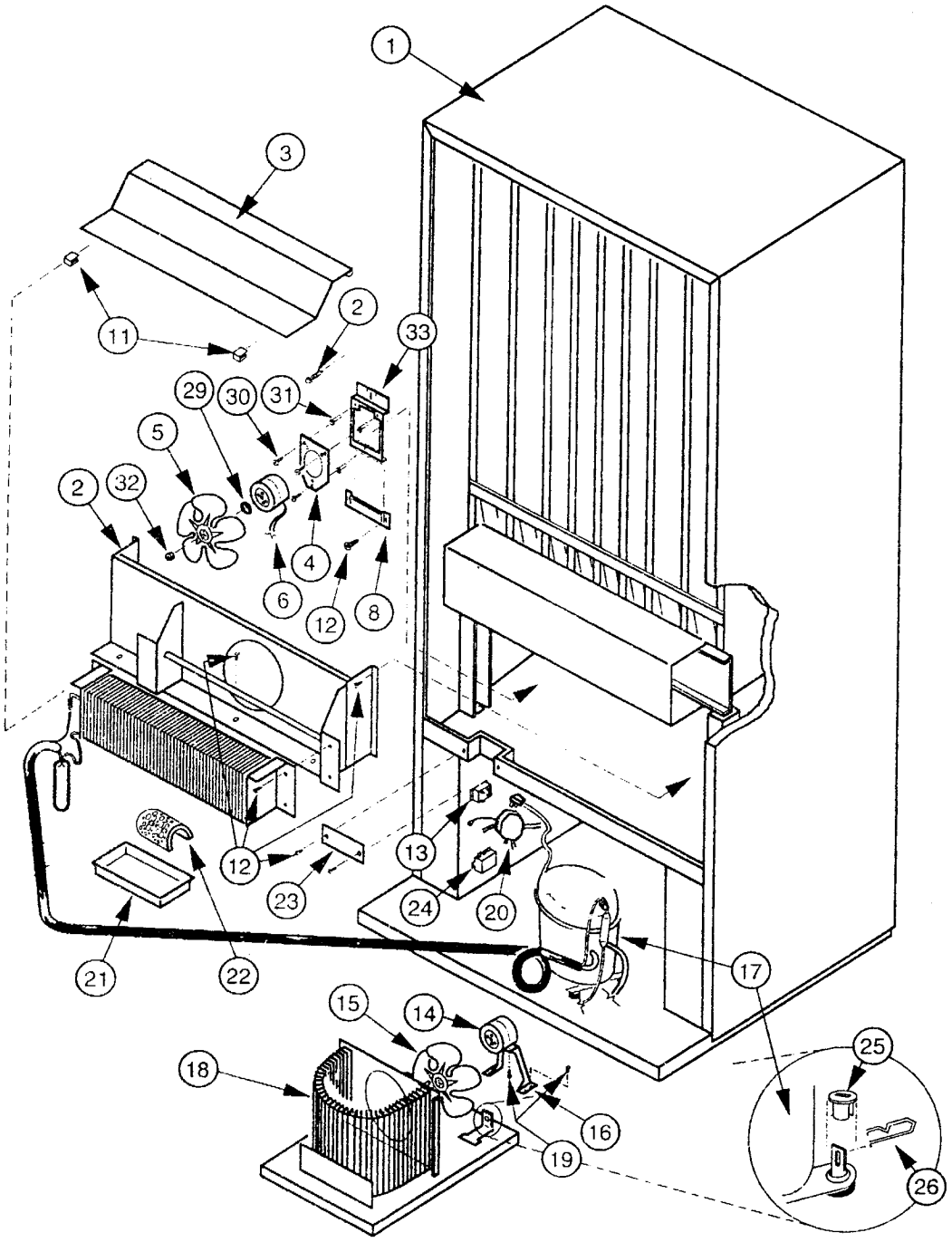
Miscellaneous Assemblies
CONTROL BOARD & WIRING, MERLIN III


TO VEND MOTORS & DOOR SWITCH
TO SELECT SWITCHES
M.D.B. TO COIN CHANGER VALIDATOR (IF USED)
LED DISPLAY

CONTROL BOARD & WIRING (VERSION 10.00)		
ITEM #	DESCRIPTION	PART NUMBER
1	Control Board 10.06	836,066,041
2	Internal H.H.C. Phone Jack and Harness	842,110,001
3	Transformer (includes harness to control board)	010,572,003
4	part of main door harness (Item # 9)	See Item #9
5	Refrigeration Relay Harness, Door Side	141,904,003
6	Select Switch Harness, 9 Select	143,901,003
	Select Switch Harness, 7 Select	141,906,003
	Select Switch Harness, 6 Select (Wide Cabinet)	149,903,003
	Select Switch Harness, 5 Select (RVCCE 200-5)	150,902,003
7	Delivery Sensor (includes harness)	836,004,001
8	Cabinet Harness, 9 Select	017,904,003
	Cabinet Harness, 7 Select	012,907,003
	Cabinet Harness, 6 Select (Wide Cabinet)	034,905,003
	Cabinet Harness, 5 Select (RVCCE 200-5)	043,903,003
9	Door Harness, 9 Select	143,905,003
	Door Harness, 7 Select	141,911,003
	Door Harness, 6 Select (Wide Cabinet)	145,901,003
	Door Harness, 5 Select (RVCCE 200-5)	150,905,003
10	Refrigeration Relay Harness, Cabinet Side	141,905,003
11	Relay (has a 24VDC coil and 110VAC switch)	836,065,001
12	Serial Changer (M.D.B.) Harness	842,079,001
13	L.E.D. (Digital) Display	010,593,004
14	L.E.D. Harness	010,564,003
15	Temperature Sensor	822,030,001

Cabinet Assemblies

CABINET, REFRIGERATION ASSEMBLY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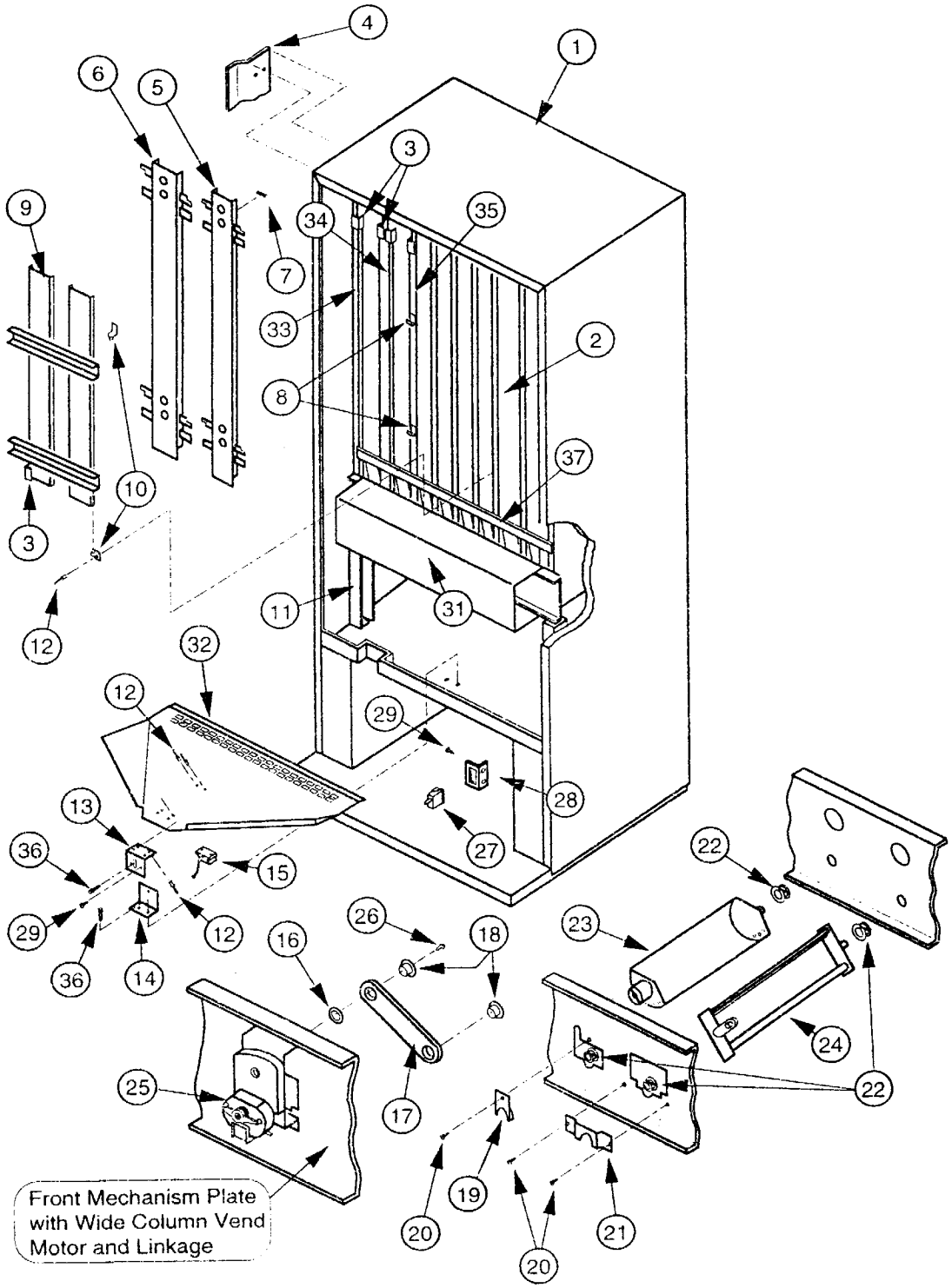
CABINET, REFRIGERATION SYSTEM		
ITEM #	DESCRIPTION	PART NUMBER
1	Foamed Cabinet Assembly 72" Wide 2 deep*	011,220,003
	Foamed Cabinet Assembly 72" Wide 3 deep*	058,220,003
	Foamed Cabinet Assembly 79" Wide 2 deep*	010,230,003
2	Evaporator Fan Shroud Assembly	010,010,003
3	Evaporator Cover	010,013,003
4	Grommet-Evaporator Fan Motor (not shown)	916,006,001
5	Fan Blade, Evaporator	810,004,001
6	Fan Motor, Evaporator	839,001,001
7	Evaporator Fan Plate	010,058,003
8	Fan Motor Bracket, Evaporator	010,006,003
9	Self Tapping Bolt 1/4-20x1"	901,003,001
10	Self Tapping Screw #8-32x1/2"	901,006,001
11	"U" Clip	906,007,001
12	Self Drilling Screw #8x1/2"	902,004,001
13	Relay (use for refrigeration) (Elec. Vend. only)	836,065,001
14	Fan Motor, Condenser	839,010,001
15	Fan Blade, Condenser	810,003,001
16	Fan Motor Bracket, Condenser	810,006,001
17	Compressor	SEE NOTE #2
18	1/3+ H.P. Refrigeration System	058,450,004
	1/3 H.P. Refrigeration System	010,493,004
	1/3+ H.P. Refrigeration System-Capacitor Start	156,430,004
18	1/3 H.P. Refrigeration System-Capacitor Start	141,420,004
19	Screw #8-32x3/8"	901,011,001
20	Main Wiring Harness, Merlin	842,063,001
	Main Wiring Harness, Electro Mechanical	842,005,001
21	Condensate Pan	810,005,001
22	Sponge	815,037,001
23	Wiring Cover Plate	010,002,003
24	In-Line Filter Assembly (Elec. Vend. only)	011,124,004
25	Grommet Plug	815,017,001
26	Compressor Clip	914,002,001
27	Relay 1/3 Tecumseh (not shown)	822,002,001
	Relay 1/3+ Tecumseh (not shown)	822,009,001
28	Overload 1/3 Tecumseh (not shown)	822,004,001
	Overload 1/3+ Tecumseh (not shown)	822,010,001
29	Silencer	N/A

30	#8-32x1/2" Screw	901,038,001
31	#8-32 Well Nut (Rubber)	905,026,001
32	1/4-20 Nut***	905,002,001
33	Mounting Bracket, Evap. Fan Plate	010,057,003
*	Denotes that a color must be specified	
***	Denotes that Loc-Tite threadlocker #262 is used on motor shaft before mounting this nut.	
NOTE #2:	This part is not available individually. It must be ordered as an assembly.	

Cabinet Assemblies

CABINET, STACK / VEND MECHANISM ASSEMBLY

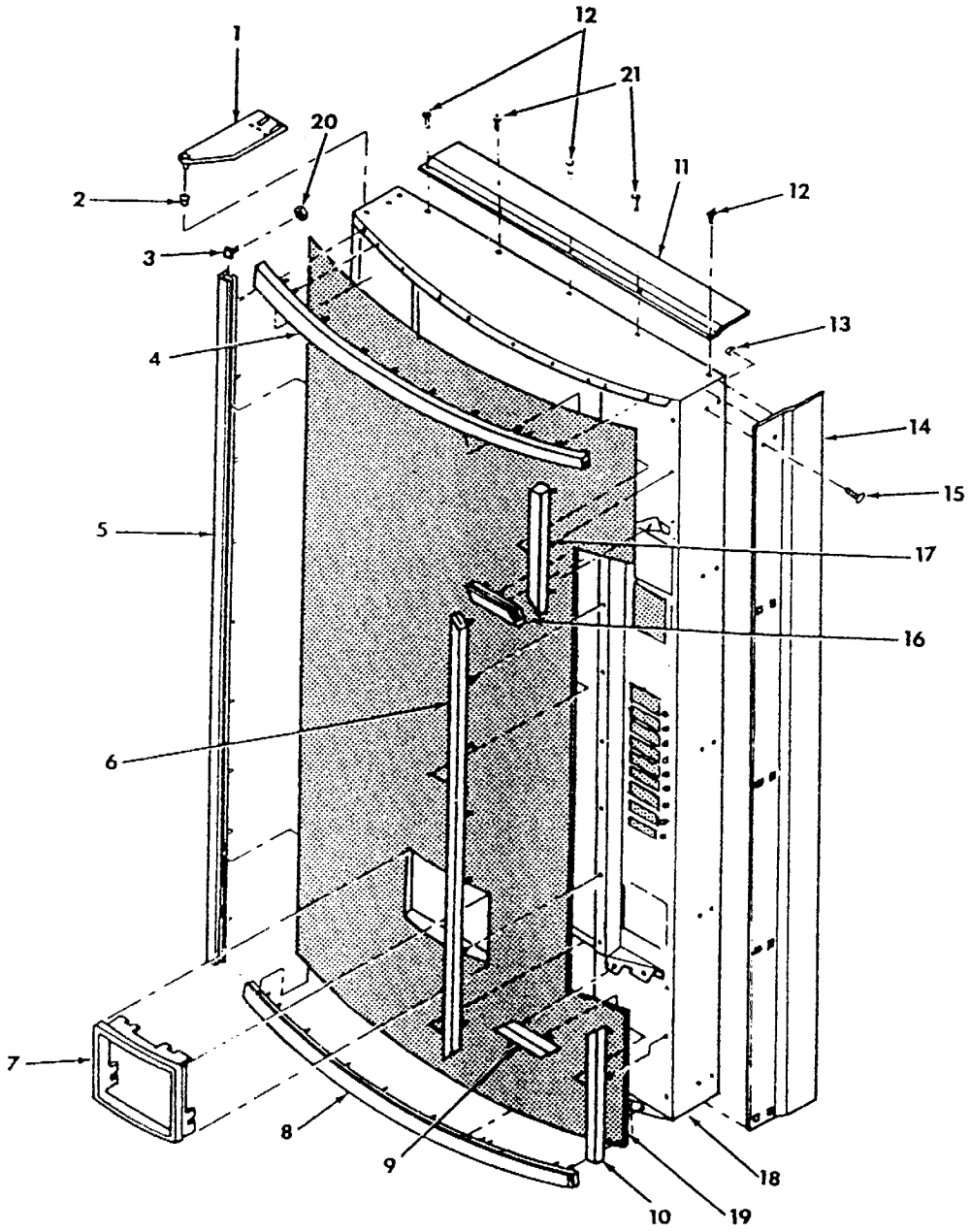

Front Mechanism Plate
with Wide Column Vend
Motor and Linkage

CABINET, VEND MECHANISM (ELECTRONIC)		
ITEM #	DESCRIPTION	PART NUMBER
1	Foamed Cabinet Assembly 72" Wide 2 deep*	011,220,003
	Foamed Cabinet Assembly 72" Wide 3 deep*	058,220,003
	Foamed Cabinet Assembly 79" Wide 2 deep*	010,230,003
2	Vend Mechanism Assembly	SEE NOTE #1
3	Hem Channel Cap	815,024,001
4	Left Cabinet Vandal Panel 79" (1302 & after)*	141,002,003
	Left Cabinet Vandal Panel 72" (1302 & after)*	142,001,003
	Left Cabinet Vandal Panel 79" (1302 & before)*	010,022,003
	Left Cabinet Vandal Panel 72" (1302 & before)*	011,001,003
5	Backspacer Assembly, Narrow Column	SEE NOTE #1
6	Backspacer Assembly, Wide Column	SEE NOTE #1
7	Spring, Backspacer	914,001,011
8	Latch, Gate	010,725,003
9	Mechanism Gate Weld Assembly	SEE NOTE #1
10	Hinge, Gate	010,726,003
11	Mechanism Support, 2 deep	010,005,003
	Thermostat Bracket/Mechanism Support, 2 deep	010,020,003
	Mechanism Support, 3 deep	058,001,003
	Thermostat Bracket/Mechanism Support, 2 deep	058,010,003
12	Pop Rivet 1/8"	908,001,001
13	Can Chute Bracket	010,018,003
14	Can Chute Tie Bracket	010,017,003
15	Delivery Sensor	836,004,001
16	Washer, Nylon 1/2" I.D.	904,001,001
17	Linkage Arm (Wide Column Motor only)	809,005,001
18	Nyliner 3/8	916,011,001
19	Rotor Retainer (Narrow Column only)	815,012,001
20	Screw #8-32x3/8"	901,011,001
21	Journal Plate (Wide Column only)	010,708,003
22	Nyliner 1/2	916,010,001
23	Rotor 2 Deep (Narrow Column only)	809,002,001
	Rotor 3 Deep (Narrow Column only)	809,007,001
	Rotor 3 Deep Plus** (Narrow Column only)	809,027,001
	Rotor 3 Deep 16oz. (Narrow Column only)	809,022,001
	Rotor 3 Deep Plus** 16oz. (Narr Column only)	809,026,001
24	Oscillator 2 Deep (Wide Column only)	809,003,001
	Oscillator 3 Deep (Wide Column only)	809,008,001
	Oscillator 3 Deep Plus** (Wide Column only)	809,025,001

25	Vend Motor(Wide Col.)-2 Deep Ass'y	010,780,004
	Vend Motor(Wide Col.)-3 Dp. Bot./79" 3 Dp. Can	058,940,004
	Vend Motor(Narr. Col.)-2 Deep & 72" 3 Deep	010,770,004
	Vend Motor(Narr Col.)-3 Dp. Bot./79" 3 Dp. Can	058,950,004
26	Self Tapping Screw with Star Washer	901,006,001
27	Door Switch	835,003,001
28	Bracket, Door Reset Button	010,045,003
29	Self Drilling Screw #8x1/2"	902,004,001
30	Cabinet Harness (Not Shown)	SEE NOTE #1
31	Motor Cover, Wide Cabinet	010,029,003
	Motor Cover, Narrow Cabinet	036,003,003
32	Can Chute Assembly 2 Deep	010,060,003
	Can Chute Assembly 3 Deep	058,020,003
	Can Chute 3 Deep Plus**	201,001,003
33	Hem Angle - Left - 2 Deep 79 1/2"	010,717,003
	Hem Angle - Left - 2 Deep 72"	011,708,003
	Hem Angle - Left - 3 Deep 79 1/2"	058,711,003
	Hem Angle - Left - 3 Deep 72"	059,707,003
34	Hem Channel - 2 Deep 79 1/2"	010,715,003
	Hem Channel - 2 Deep 72"	011,711,003
	Hem Channel - 3 Deep 79 1/2"	058,709,003
	Hem Channel - 3 Deep 72"	059,706,003
35	Hem Angle - Right - 2 Deep 79 1/2"	010,716,003
	Hem Angle - Right - 2 Deep 72"	011,709,003
	Hem Angle - Right - 3 Deep 79 1/2"	058,712,003
	Hem Angle - Right - 3 Deep 72"	059,708,003
36	Self Tapping Screw 1/4 - 20 X 1"	901,003,001
37	Tie Strip	SEE NOTE #1
•	Rear Can Retainer (Not Shown)	810,007,001
•	Wire Tie, 4" (Not Shown; Holds S.O. Harness)	916,007,001
•	Wire Tie, Large (Not Shown)	916,008,001
*	Denotes that a color must be specified	
* *	Denotes 3 Deep Plus (any 3 deep vendor with serial number 1352XX-XXXX and greater)	
NOTE #1:	There are various parts, please specify model and serial number at the time of order	

Door Assemblies

MAIN DOOR, FRONT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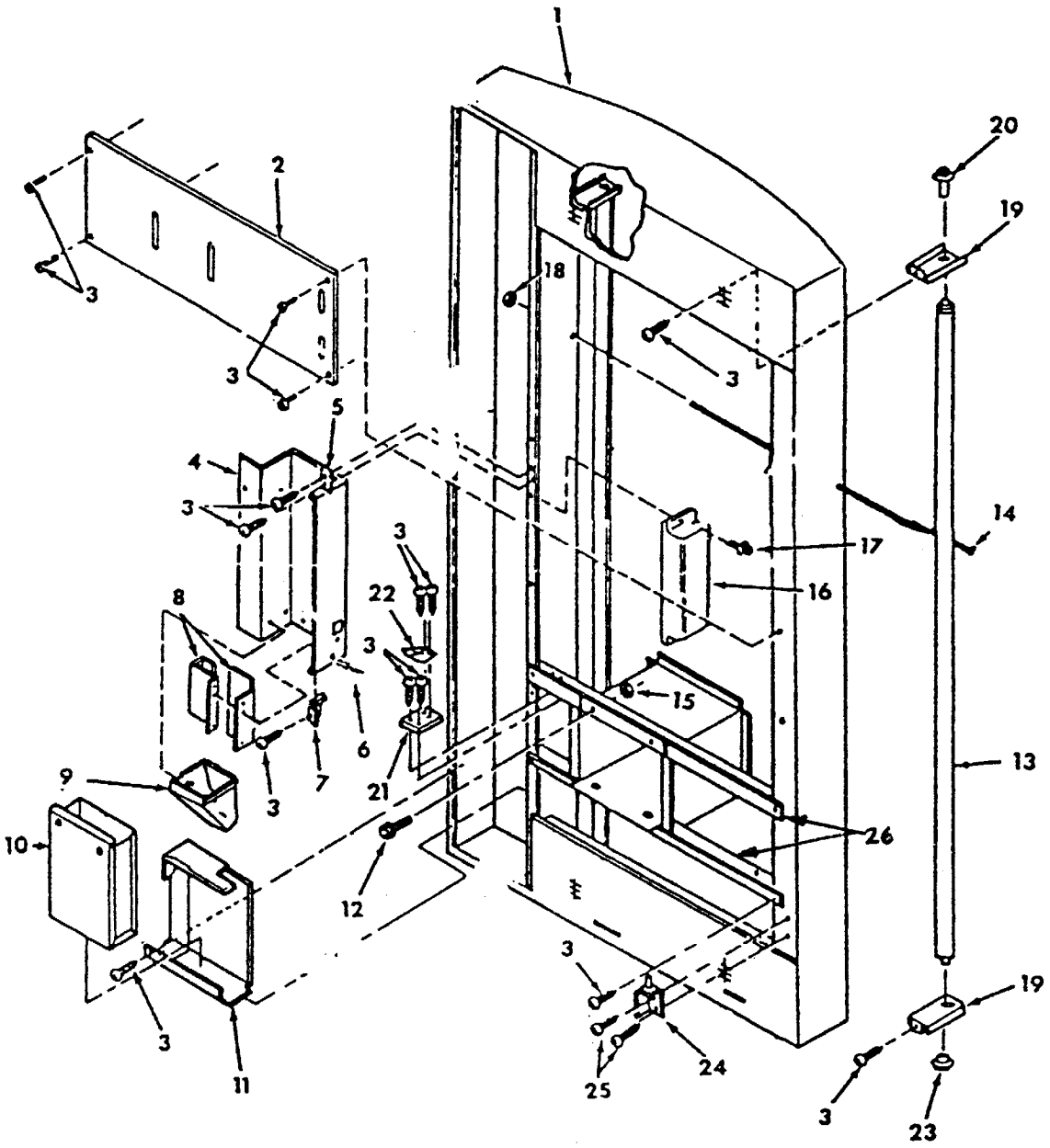
MAIN DOOR, FRONT		
ITEM #	DESCRIPTION	PART NUMBER
1	Top Door Hinge	810,002,001
2	Top Door Bushing	803,003,001
3	T-Screw, #8-32	901,001,001
4	Top Trim, Coke 79" Wide	141,552,003
	Top Trim, Coke 72" Wide	141,552,003
5	Left Trim, Coke 79" Wide	141,553,003
	Left Trim, Coke 72" Wide	142,502,003
6	Right Insert Trim, Coke 79" Wide	141,556,003
	Right Insert Trim, Coke 72" Wide	141,556,003
7	Port Trim	815,019,001
8	Bottom Trim, Coke 79" Wide	141,552,003
	Bottom Trim, Coke 72" Wide	141,552,003
9	Bottom Insert Trim, Coke 79" Wide	141,558,003
	Bottom Insert Trim, Coke 72" Wide	141,558,003
10	Right Side Bottom Trim, Coke 79" Wide	141,555,003
	Right Side Bottom Trim, Coke 72" Wide	141,555,004
11	Rain Guard, Wide Vendor	010,518,003
	Rain Guard, Narrow Vendor	036,503,003
12	Pop Rivet, 1/8"	908,001,001
13	Nut, 1/4-20	905,002,001
14	Right Vandal Panel 79"*	010,519,003
	Right Vandal Panel 72"*	011,501,003
15	Carriage Bolt 1/4-20x1/2"	901,007,001
16	Top Insert Trim, Coke 79" Wide	141,557,003
	Top Insert Trim, Coke 72" Wide	141,557,003
17	Top Trim, Coke 79" Wide	141,552,003
	Top Trim, Coke 72" Wide	141,552,003
18	Door Weld Assembly, Coke 79"	141,510,003
	Door Weld Assembly, Coke 72" Wide	142,510,003
19	Sign	SEE NOTE #1
20	Nut, #8-32	905,001,001
21	Self Drilling Screw, #8x1/2"	902,004,001
NOTE #1:	There are various parts, please specify model and serial number at the time of order	

Door Assemblies

MAIN DOOR, REAR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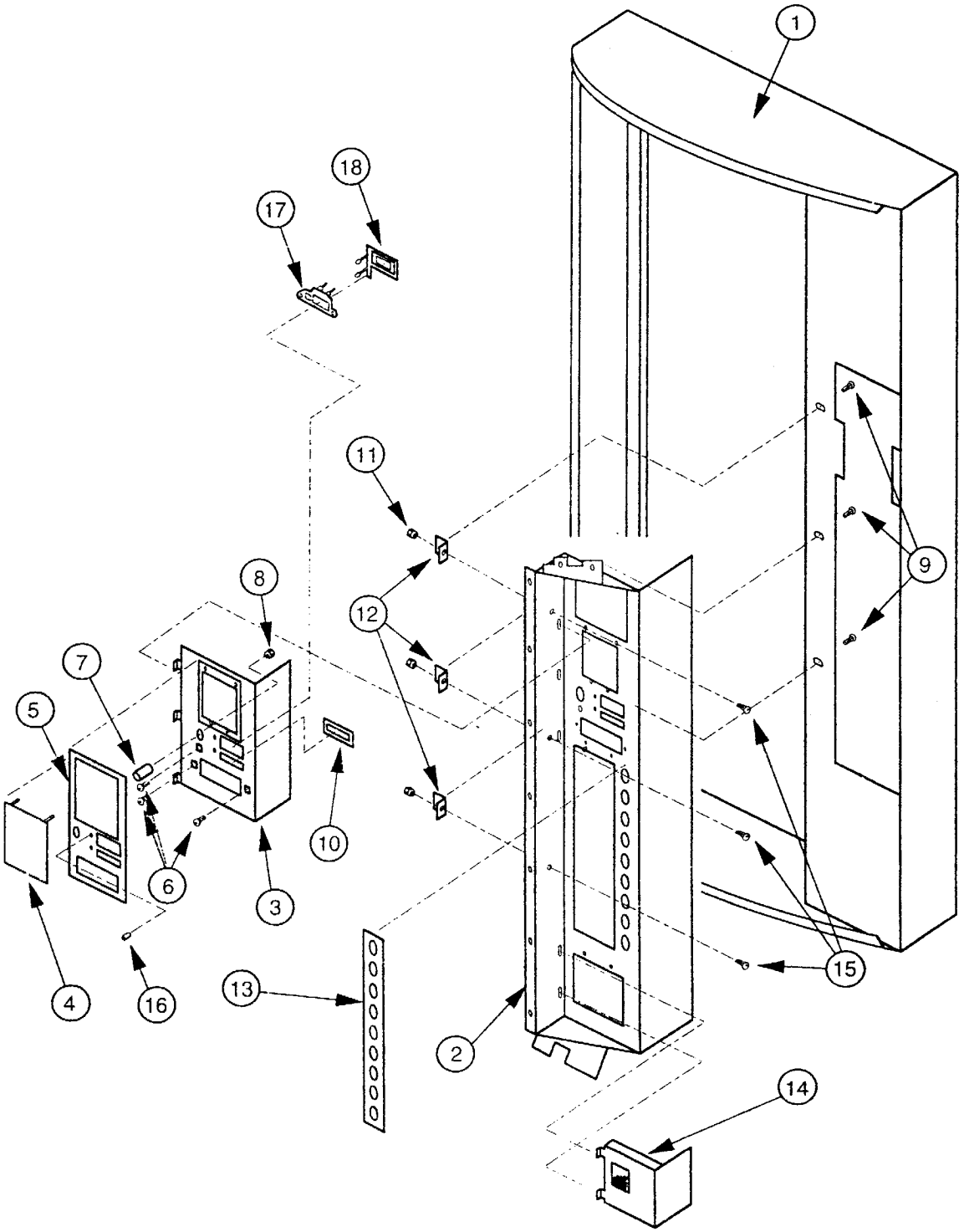
MAIN DOOR, REAR ASSEMBLY		
ITEM #	DESCRIPTION	PART NUMBER
1	Main Door Welded Assembly, 79" Wide Vendors	141,510,003
	Main Door Welded Assembly, 72" Wide Vendors	142,510,003
2	Lamp Guard, Wide Vendors	012,514,003
	Lamp Guard, Narrow Vendor	040,501,003
3	Screw, -#8-32x3/8"	901,011,001
4	Changer Door	010,544,003
5	Changer Door Hinge, Top	010,525,003
6	Pop Rivet, 1/8"	908,004,001
7	Changer Door Hinge, Bottom	010,524,003
8	Bottom Coin Chute Assembly (To Coin Box)	012,593,003
9	Coin Hopper	815,015,001
10	Coin Box Welded Assembly	010,580,003
11	Coin Box Housing	010,537,003
12	Carriage Bolt, 1/4-20x1/2"	901,007,001
13	Lamp, High Output For 79" Vendors	841,001,001
	Lamp, High Output For 72" Vendors	841,002,001
14	Tie Rod	811,001,001
15	Keps Nut, 1/4-20	905,002,001
16	Ballast Assembly, 79" Wide Vendors	010,950,004
	Ballast Assembly, 72" Wide Vendors	011,930,004
17	Self Drilling Screw, #8-32	902,004,001
18	Elastic Stop Nut	905,004,001
19	Lamp Bracket	010,517,003
20	Top Lampholder (Spring-Loaded)	842,001,001
21	Latch Roller Bracket	010,516,003
22	Burst Open Latch Strike	812,003,001
23	Bottom Lampholder	842,002,001
24	Bottom Inner Door Hinge	010,550,003
25	Self Tapping Screw, 1/4-20x1"	901,003,001
26	Port Brace, Wide Vendors	010,515,003
	Port Brace, Narrow Vendor	036,502,003

Door Assemblies

VANDAL RESISTANT MAIN DOOR ASSEMBLY, FRONT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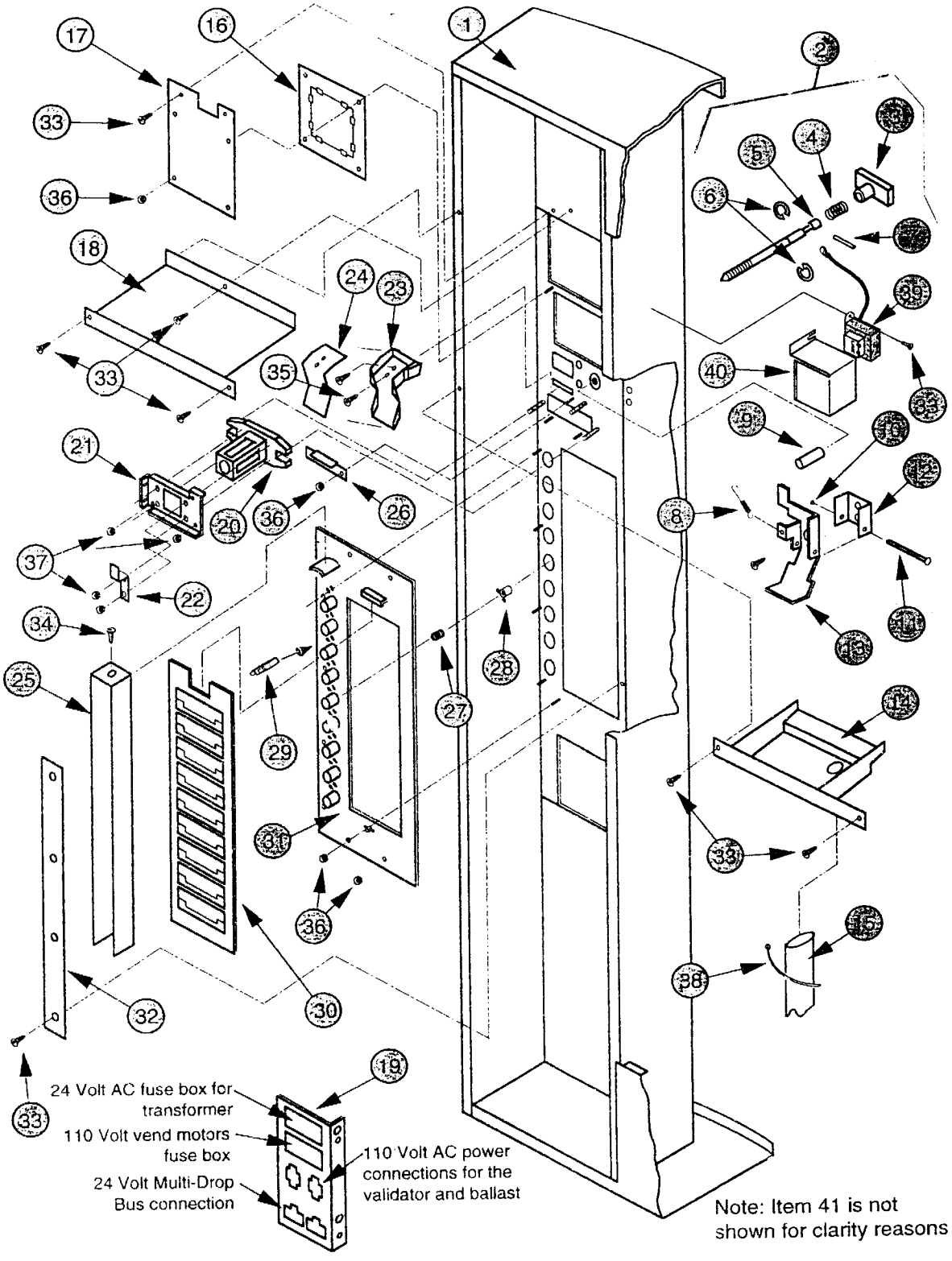
VANDAL RESISTANT DOOR, FRONT		
ITEM #	DESCRIPTION	PART NUMBER
1	Door Welded Assembly, 79" Coke	141,510,003
	Door Welded Assembly, 72" Coke	142,510,003
2	Control Panel, Coke 9 Select	143,501,003
3	Security Plate Welded Assembly	141,550,003
4	Validator Cover, Coke	010,535,003
5	Security Plate Decal, Electronic	845,396,001
6	T-Bolt, 1/4-20x1"	901,037,001
7	Bushing, Button Coin Return	803,030,001
8	Hex Jam Nut 9/16-18 UNF2A	905,019,001
9	Screw #8-32x3/8"	901,011,001
10	Coin Plate, Coke	141,516,003
11	Keps Nut, 1/4-20	905,002,001
12	Hold Down Angle	123,505,003
13	Decal, Select Button	845,383,001
14	Coin Cup Mounting Plate Welded Assembly	123,550,003
15	Carriage Bolt 1/4-20x1/2"	901,007,001
•	L.E.D. Assembly (Items 16, 17 &18)	010,593,014
16	L.E.D. Lens	N/A
17	L.E.D. Window	N/A
18	L.E.D. Display	N/A

Door Assemblies

VANDAL RESISTANT MAIN DOOR ASSEMBLY, REAR

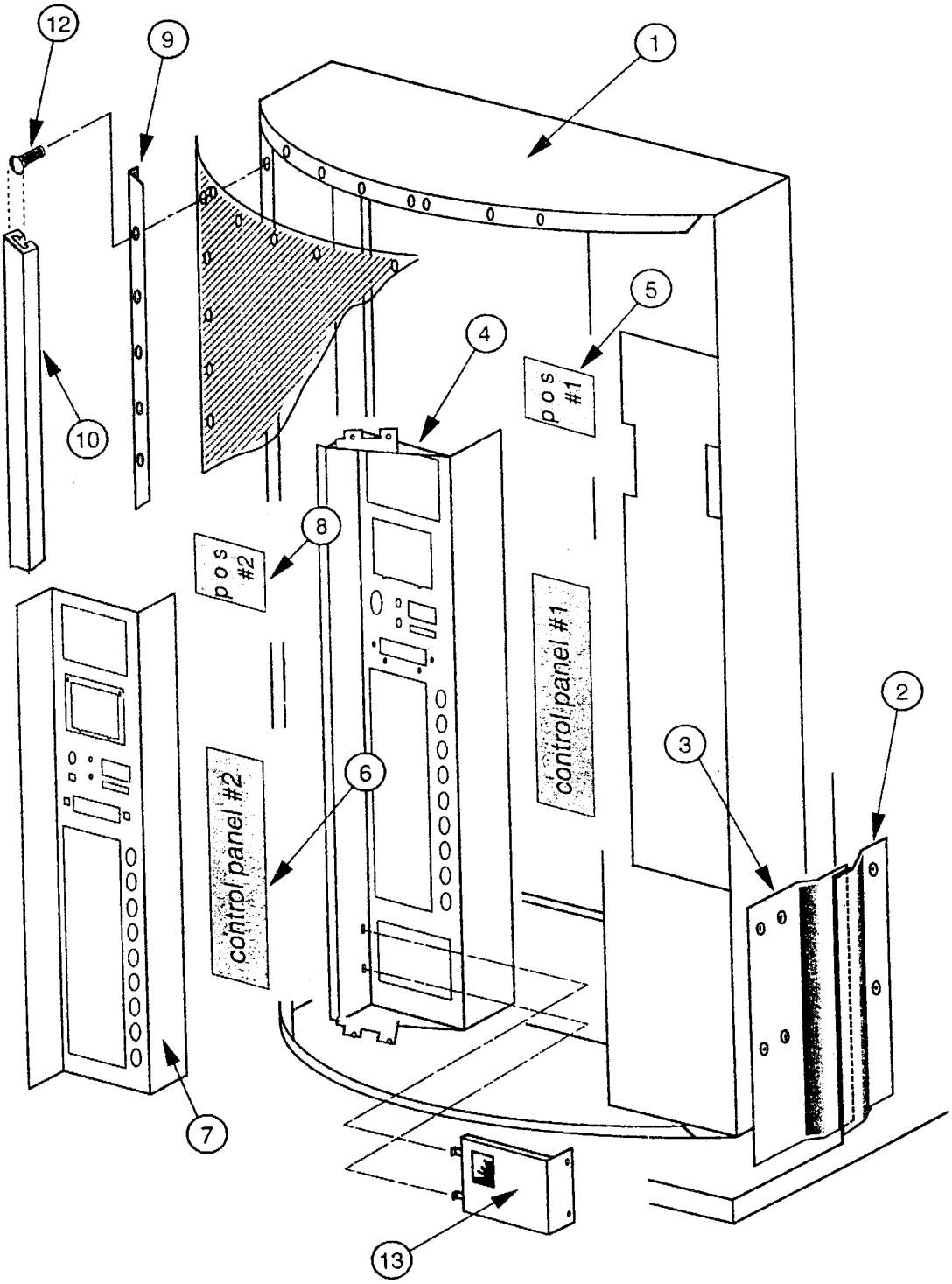

24 Volt AC fuse box for transformer
110 Volt vend motors fuse box
24 Volt Multi-Drop Bus connection
110 Volt AC power connections for the validator and ballast
Note: Item 41 is not shown for clarity reasons

VANDAL RESISTANT DOOR, REAR		
ITEM #	DESCRIPTION	PART NUMBER
1	Door Welded Assembly, 79" Coke	141,510,003
	Door Welded Assembly, 72" Coke	142,510,003
2	Flush Mount T-Handle Assembly	812,176,001
3	Flush Mount T-Handle Only	SEE NOTE #2
4	Spring	SEE NOTE #2
5	T-Handle Stud	SEE NOTE #2
6	Retaining Ring	SEE NOTE #2
7	Pin, T-Handle Stud	SEE NOTE #2
8	Sold Out Spring	914,003,001
9	Button, Coin Return Lever	803,031,001
10	Retainer Ring 5/32"	906,005,001
11	Roller Pin, Door Lifter	811,002,001
12	Hinge, Coin Return Lever	141,506,003
13	Coin Return Lever	141,504,003
14	Catch Basin, Bill Validator	095,509,003
15	Catch Basin, Drain Tube	825,038,001
16	P.O.S. Window	815,007,001
17	P.O.S. Window Plate	123,503,003
18	Security Shelf	141,517,003
19	Fuse Bracket, I.E.C.	141,522,003
20	T-Handle Housing	SEE NOTE #2
21	T-Handle Brace	141,513,003
22	Lever Stop	141,514,003
23	Coin Chute	815,001,001
24	Coin Chute Cover	815,002,001
25	Splash Guard	815,169,001
26	Coin Ramp	141,508,003
27	Spring, Select Button	914,019,001
28	Select Button	815,165,001
29	Switch, Miniature	835,001,001
30	Carrier Strip Assembly	815,167,001
31	Button Panel	815,168,001
32	Retaining Strap	141,507,001
33	Screw, #8-32x3/8"	901,011,001
34	Screw, Self Drilling #8x1/2"	902,001,001
35	Screw #6-32x3/8"	901,004,001
36	Nut #8-32	905,001,001

37	Nut, 1/4-20	905,002,001
38	Wire Tie, Large	916,008,001
39	Transformer Assembly	010,572,003
40	Transformer Cover	010,063,003
41	72" Ballast Assembly	011,930,003
	79" Ballast Assembly	010,950,003
NOTE #2:	This part is not available individually. It must be ordered as an assembly.	

Door Assemblies

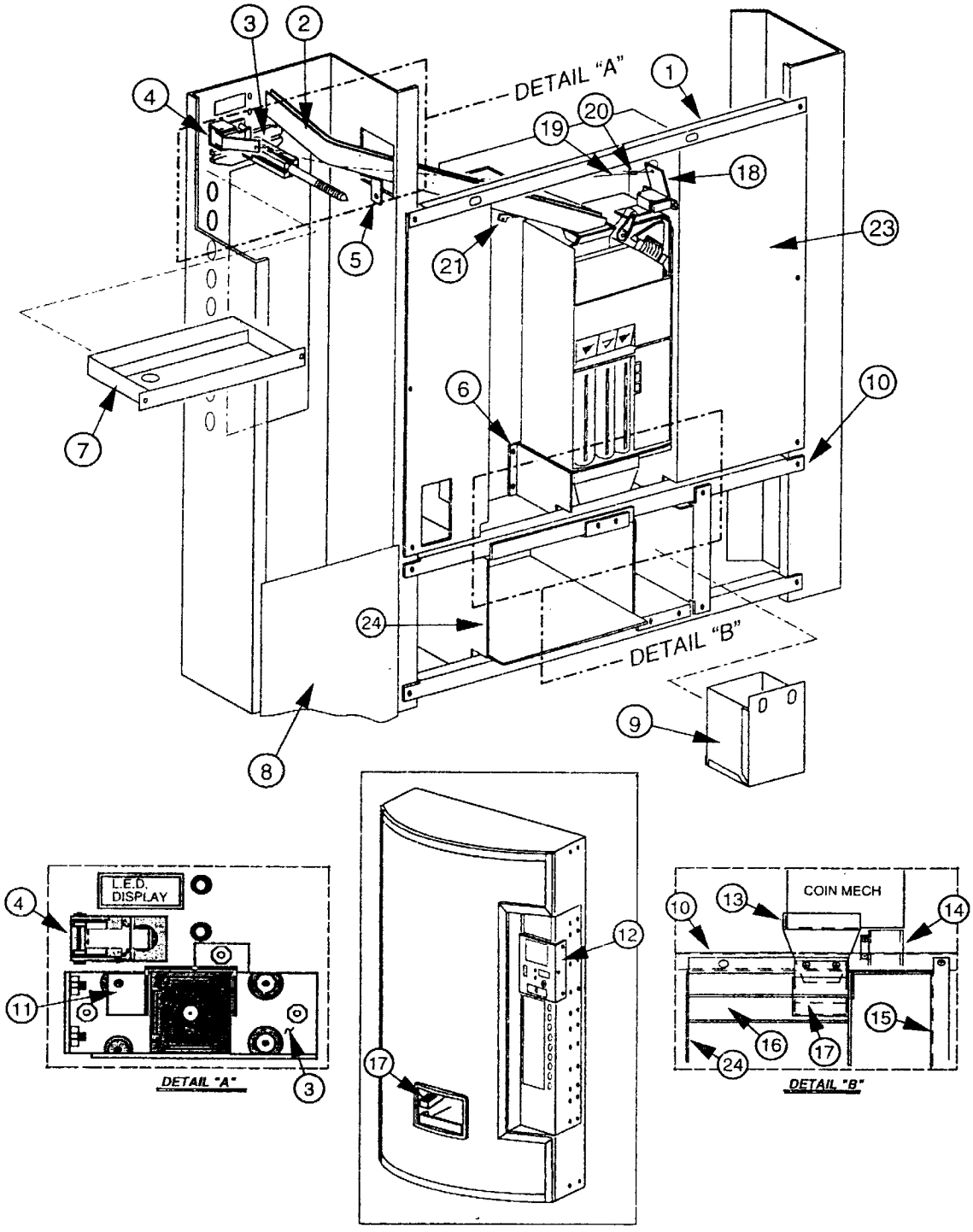
"TUFF GUY" VANDAL RESISTANT DOOR PARTS


12
9
1
10
5
4
pos #1
8
pos #2
control panel #1
2
3
6
control panel #2
7
13

TUFF GUY DOOR, FRONT		
ITEM #	DESCRIPTION	PART NUMBER
1	Door Welded Assembly, 79" Coke	141,510,003
	Door Welded Assembly, 72" Coke	142,510,003
2	Vandal Panel Cover 79"	171,101,003
	Vandal Panel Cover 72"	172,001,003
3	Right Vandal Panel 79"	010,519,003
	Right Vandal Panel 72"	011,501,003
4	Bolt On Control Panel, 9 Select	143,510,003
	Bolt On Control Panel, 7 Select	141,530,003
5	P.O.S. Window	815,007,001
6	Lexan Panel	171,522,003
7	Front Security Plate, 9 Select	183,510,003
	Front Security Plate, 7 Select	181,510,003
8	P.O.S. Lexan Cover	171,523,003
9	Metal Bolt-On Trim, Top/Bottom All Wide	171,502,003
	Metal Bolt-On Trim, Left 79"	171,507,003
	Metal Bolt-On Trim, Top/Bottom Right 79"	171,505,003
	Metal Bolt-On Trim, Enclosure Trim All	171,512,003
	Metal Bolt-On Trim, Right 79"	171,506,003
10	Plastic Trim, Top/Bottom All Wide	171,513,003
	Plastic Trim, Top Right 79"	171,516,003
	Plastic Trim, Top/Bottom Enclosure 79"	171,512,003
	Plastic Trim, Bottom Right 79"	171,517,003
	Plastic Trim, Left Trim 79"	171,514,003
11	Nut, 1/4-20	905,002,001
12	T-Bolt, 1/2-20x1"	901,037,001
13	Coin Cup	161,505,003

Door Assemblies

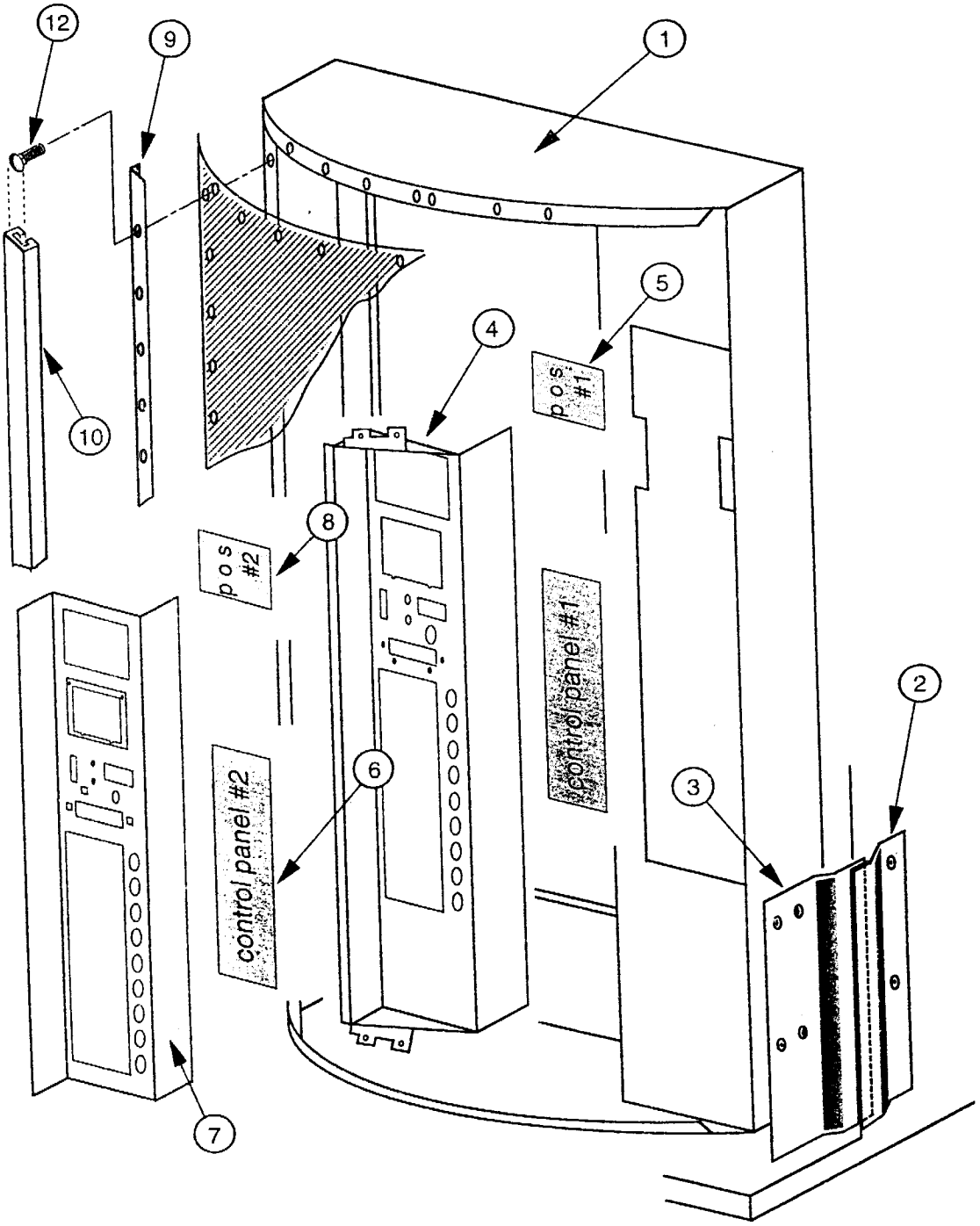
CENTER CHANGER DOOR ASSEMBLY


DETAIL "A"
DETAIL "B"
L.E.D. DISPLAY
DETAIL "A"
COIN MECH
DETAIL "B"

CENTER DOOR CHANGER ASSEMBLY		
ITEM #	DESCRIPTION	PART NUMBER
1	CHANGER VAULT BRACE	161,518,003
2	COIN CHUTE ASSY / CDC / 79.5"	161,590,004
	COIN CHUTE ASSY / CDC / 72"	162,540,004
3	T-HANDLE BRACE (SEE DETAIL "A")	161,531,003
4	BUTTON LEVER ASSY (SEE DETAIL "A")	161,594,004
5	COIN CHUTE BRACKET 79.5"	161,527,003
	COIN CHUTE BRACKET 72"	162,502,003
6	HOPPER MOUNTING BRACKET	161,515,003
7	CATCH BASIN ASSY / CDC / 79.5"	161,580,004
	CATCH BASIN ASSY / CDC / 72"	162,530,004
8	SELECT PANEL PLATE	161,512,003
9	COIN BOX W/A	161,570,003
10	W/A PORT BRACE	161,541,003
11	LOCK CYLINDER COVER (SEE DETAIL "A")	161,532,003
12	SECURITY PLATE WELD ASSEMBLY	195,510,003
13	COIN HOPPER	815,015,001
14	COIN BOX COIN CHUTE/BACK	161,516,003
	COIN BOX COIN CHUTE	161,517,003
15	COIN BOX & PORT BODY W/A	195,540,003
16	ANTI-THEFT PLATE	161,504,003
	ANTI-THEFT PLATE / CDC / BOTTLES	161,545,003
17	COIN CUP	161,505,003
18	COIN RETURN LEVER ASSY	161,593,004
19	3/64" DIA. CABLE	911,020,001
20	CABLE SLEEVE (AT EACH END OF CABLE)	906,015,001
21	SUPPORT BRACKET / COIN CHUTE	161,537,003
22	CHANGER VAULT W/A	161,591,003
•	COIN INSERT ASSEMBLY	195,560,003
•	CHANGER VAULT DOOR (NOT SHOWN)	161,534,003

Door Assemblies

"TUFF GUY" CENTER CHANGER DOOR PARTS


12
9
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4
10
pos #1
8
pos #2
control panel #1
2
6
3
control panel #2
7

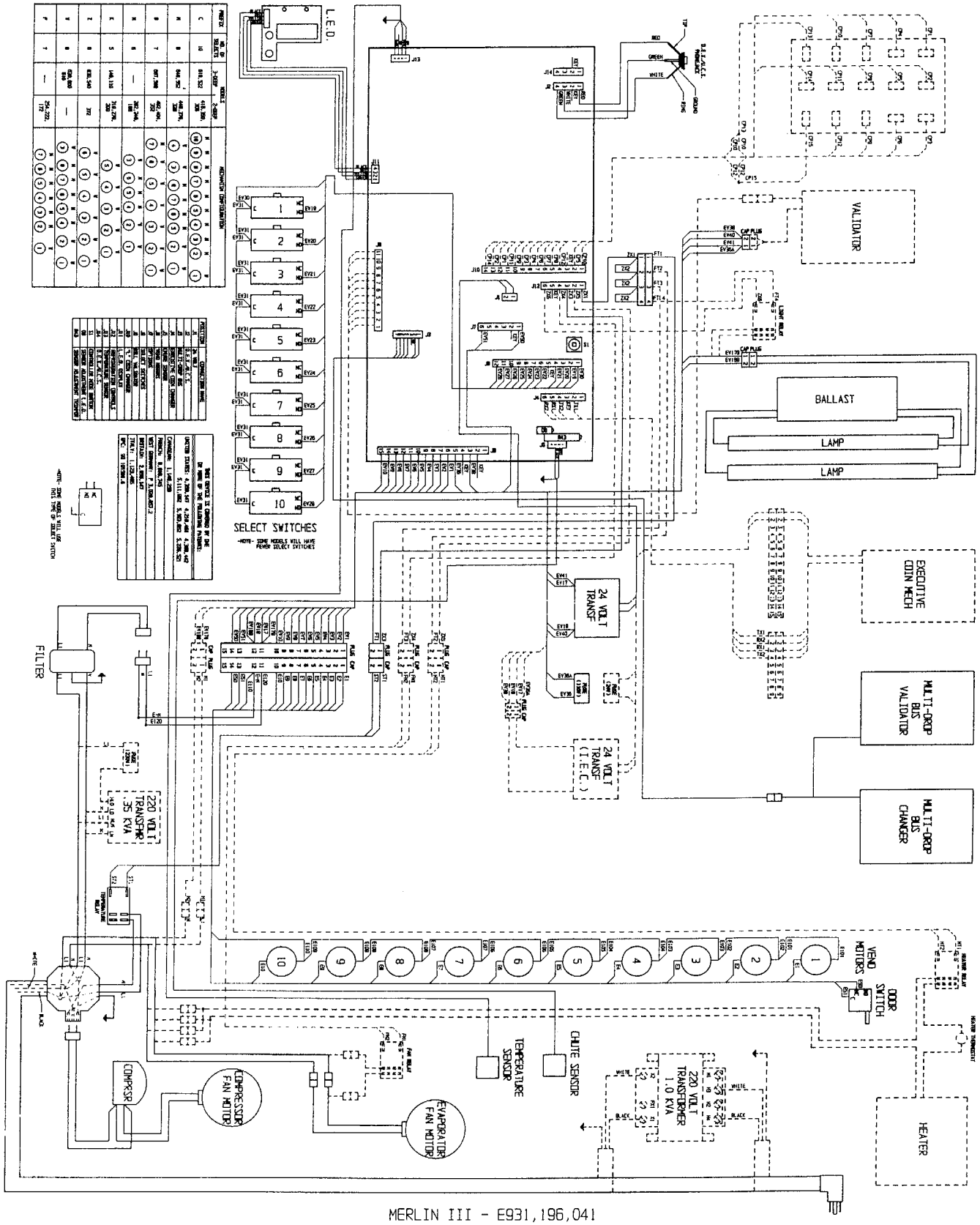
TUFF GUY C.D.C., FRONT		
ITEM #	DESCRIPTION	PART NUMBER
1	Door Welded Assembly, C.D.C., 79" Coke	161,510,003
	Door Welded Assembly, C.D.C., 72" Coke	162,510,003
2	Vandal Panel Cover 79"	171,101,003
	Vandal Panel Cover 72"	172,001,003
3	Right Vandal Panel 79"	010,519,003
	Right Vandal Panel 72"	011,501,003
4	Bolt On Control Panel, C.D.C., 9 Select	143,510,003
	Bolt On Control Panel, C.D.C., 7 Select	141,530,003
5	P.O.S. Window	815,007,001
6	Lexan Panel	171,522,003
7	Front Security Plate, C.D.C., 9 Select	173,510,003
	Front Security Plate, C.D.C., 7 Select	171,510,003
8	P.O.S. Lexan Cover	171,523,003
9	Metal Bolt-On Trim, Top/Bottom All Wide	171,502,003
	Metal Bolt-On Trim, Left 79"	171,507,003
	Metal Bolt-On Trim, Top/Bottom Right 79"	171,505,003
	Metal Bolt-On Trim, Enclosure Trim All	171,512,003
	Metal Bolt-On Trim, Right 79"	171,506,003
10	Plastic Trim, Top/Bottom All Wide	171,513,003
	Plastic Trim, Top Right 79"	171,516,003
	Plastic Trim, Top/Bottom Enclosure 79"	171,512,003
	Plastic Trim, Bottom Right 79"	171,517,003
	Plastic Trim, Left Trim 79"	171,514,003
11	Nut, 1/4-20	905,002,001
12	T-Bolt, 1/2-20x1"	901,037,001

APPENDIX A

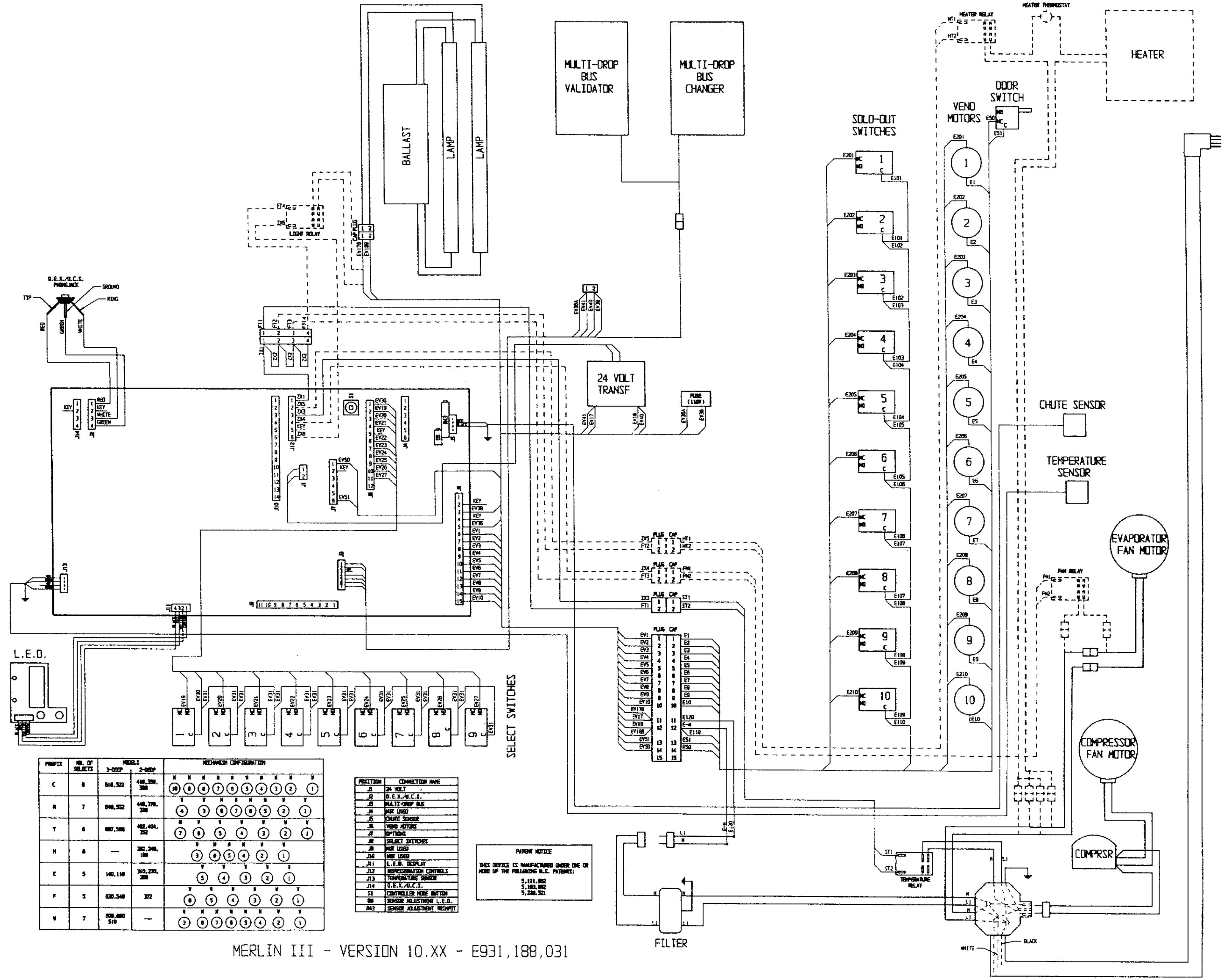
WIRING DIAGRAMS

E931, 196, 041
(Does not include sold-out paddles)
For Merlin III vendors with serial numbers 1320XX-XXXX and greater, use this wiring diagram

E931, 188, 031
(Includes sold-out paddles)
For Merlin III vendors with serial numbers prior to 1320XX-XXXX, use this wiring diagram



MERLIN III - E931,196,041



PREFIX	NO. OF SELECTS	MODELS 3-DEEP	MODELS 2-DEEP	MECHANISM CONFIGURATION
C	8	610,522	410,350, 300	N N N N N N N N N V / (10) (9) (8) (7) (6) (5) (4) (3) (2) (1)
N	7	640,552	440,370, 330	V V N N N N V V / (4) (3) (8) (7) (6) (5) (2) (1)
Y	6	667,500	402,404, 352	N V V V V V V / (7) (6) (5) (4) (3) (2) (1)
H	6	—	282,240, 186	V N N N V V / (3) (6) (5) (4) (2) (1)
K	5	140,110	310,270, 200	V V V V V / (5) (4) (3) (2) (1)
F	5	630,540	372	V V V V V V / (6) (5) (4) (3) (2) (1)
U	7	530,600 510	—	V N N N N N V V / (3) (8) (7) (6) (5) (4) (2) (1)

POSITION	CONNECTION NAME
J1	24 VOLT
J2	D.E.X./U.C.S.
J3	MULTI-DROP BUS
J4	NOT USED
J5	CHUTE SENSOR
J6	VEND MOTORS
J7	OPTIONS
J8	SELECT SWITCHES
J9	NOT USED
J10	NOT USED
J11	L.E.D. DISPLAY
J12	REFRIGERATION CONTROLS
J13	TEMPERATURE SENSOR
J14	D.E.X./U.C.S.
S1	CONTROLLER MODE BUTTON
D6	SENSOR ADJUSTMENT L.E.D.
RV3	SENSOR ADJUSTMENT TRIMPOT

PATENT NOTICE

THIS DEVICE IS MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS:

5,111,862
5,183,862
5,236,521

MERLIN III - VERSION 10.XX - E931,188,031

THIS ROYAL VENDORS PRODUCT IS COVERED BY THE FOLLOWING PATENTS

United States

4,359,147 5,111,962 5,193,862 5,226,521

Licensed for use under U.S. Patent Numbers 4,216,461 and 4,369,442

Other U.S. and foreign patents pending

Royal Vendors Publication
833,006,001

REV. E 9/96