



**AUTOMATIC PRODUCTS**

**203**

**HOT DRINK MERCHANDISER  
SERVICE MANUAL**

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(FOR USE WITH SOFTWARE DATECODE 022890 OR LATER)



## FEATURES OF AP 203 HOT DRINK MERCHANDISER

### SELECTION SYSTEM

- o Four prime selections each with three programmable strengths plus chocolate and soup.
- o Easy to use color coded selection buttons for variable strength products.
- o Over 330 selections possible.
- o Coffee strength variable by changing throw and/or brewing time.
- o Artificial sweetener available.
- o Variable strength additives.
- o Easy to change selection labels.
- o Selection lamps and audible tone feedback for touch sensitive buttons.
- o Multi-vend possible.
- o Coins for the next vend can be inserted before the end of the current vend.

### PRICING

- o All selections individually priced.
- o Two price levels for variable strength selections.
- o Separate discount pricing structure available.
- o Separate debit card pricing available.
- o Programmable winner mode available as standard.
- o Free vend feature.
- o Forced vend and bill escrow features.
- o Full accountability including ten separate price line counters and discount cash meter and counter

### SCROLLING DISPLAY

- o User friendly scrolling display to help with the selection process and provide customer feedback.
- o Programmable for stand-by 'operator' messages, up to 85 characters long.

### OPTIONS

- o 12 ounce brewed coffee
- o Fresh brewed tea
- o Whipped GFIC or gourmet coffee
- o USE YOUR OWN CUP option
- o 24V (standard) or 110V capability for coin mech or validator

### SPECIFICATIONS

#### DIMENSIONS:

Height: 72"      Depth: 31"      Width: 38"

#### ELECTRICAL AND WATER REQUIREMENTS:

Electrical: 120 Volts; 60 Hz; 16 Amps  
Water: Potable cold water, 20 psi minimum

#### SHIPPING WEIGHT

Freeze-dried	460 lbs.
Loose ground	500 lbs.
Grinder	560 lbs.

### MODELS AND CAPACITIES

Ingredient:	Capacities lbs.					
	DG	G	GLG	DH	LG	FD
Regular Coffee Beans	11	16	11.5	-	-	-
Decaf. Coffee Beans	5	-	-	-	-	-
Regular Ground Coffee	-	-	-	11	12	-
Decaf. Ground Coffee	-	-	3.5	4.5	-	-
Freeze Dried Coffee	-	-	-	-	-	3
Soluble Coffee/Decaf.	1.5	1.5	1.5	1.5	1.5	1.5
Tea    Leaf-Fresh brewed	2.5	2.5	2.5	2.5	2.5	2.5
or Instant	1.5	1.5	1.5	1.5	1.5	1.5
Sugar	8	8	8	8	8	8
Sugar Substitute	10oz	10oz	10oz	10oz	10oz	10oz
Whitener	4	4	4	4	4	4
Chocolate	12	12	12	12	12	12
Soup	4	4	4	4	4	4

### CUPS:

7oz	780
8 1/4oz	720
12oz	615

# AP 203 INSTALLATION AND SET-UP INSTRUCTIONS

## INSTALLATION

Unpack the vendor:

1. Remove shipping carton and plastic bag from vendor. Inspect exterior of cabinet for damage.
2. Remove clip from lock handle and open front door. If machine is equipped with a lock, the keys will be in the cup well. Inspect cabinet interior for evidence of damage.
3. Remove packing tape from coffee hopper swing out bracket, cup dispenser door, commodity trough and steam deflector, overflow and grounds waste floats.
4. Remove all cartons from floor of machine. These cartons will contain the kickplate, grinder swing out bracket, coffee or bean hoppers.

## LOCATION SITE REQUIREMENTS

This vendor requires an external source of water and electricity for operation. The minimum requirements for these utilities are as follows:

### WATER

The installation site must have a cold drinking water supply line that can be permanently coupled to the vendor. The water line should be one-half inch minimum diameter and be equipped with a manual shutoff within six feet of the machine. Water pressure should maintain 20 psi minimum while the vendor is taking on water. If water pressure exceeds 90 psi, a pressure regulator should be installed in the line.

### ELECTRICITY

A grounded electrical outlet rated at 120 volts, 60Hz, single phase and capable of delivering 20 amperes must be available within six feet of the vendor.

## SET-UP INSTRUCTIONS

Set up the vendor at the location as follows:

1. Carefully level the vendor front to back and side to side.
2. Swing coffee hopper support bracket out and install hopper. Be sure to engage auger driver with motor drive pin. Connect two harness leads to thumper solenoid.
3. If the machine is a 203G or DG or GLG, the swing out bracket assembly and hopper will be packed separately and placed on the floor of the machine. After unpacking, they can be installed on the hinge bracket and the electrical harnesses connected. Be sure to secure the sliding gate (located on the sloped surface of the bean hopper) in the fully open position to allow beans into the grinder(s). Install coffee delivery chute to bottom of swing out bracket and position for best possible delivery of grounds to brewer.
4. Install water filter cartridge (if so equipped). Close water tank drain valve.
5. Remove brewer sheet metal cover. Locate 1/4-20 shipping bolt behind brewer latch, remove using 3/8" socket or wrench. Remove cup dispenser shipping screw and nut.
6. Connect the vendor to the water supply line using 3/8" O.D. soft copper tubing allowing one complete coil approximately three feet in diameter between the water supply line and vendor to allow movement of the vendor for cleaning and to reduce noise due to water pressure surges.
7. Plug machine into a 120V 20A receptacle. Set all three switches to the on position. Check that the tank starts to fill and that there are no leaks. The cup spiral motor will run for thirty seconds or until the cup present switch is depressed. The machine is equipped with a safety feature - if the inlet water valve is on for more than 90 seconds it will put the machine 'OUT OF ORDER'. To complete the filling of the heater tank you will have to power down-power up the control board to reset the 90 second timer.
- ◆ DO NOT LIFT THE FLOAT ROD OR SWITCH WHILE THE TANK IS FILLING. THIS WILL SIGNAL THE LOGIC BOARD THAT THE TANK IS FULL AND THE HEATERS WILL BE TURNED ON REGARDLESS OF THE LEVEL OF WATER IN THE TANK.
8. Remove the packing block on top of the chocolate canister.
9. Remove packing tie downs holding the rinse hose to the top of the humidity bar.
10. Loosen the two screws holding the brewer grounds splash guard on the front of brewer. The shield is designed to be able to swing a little as the spent grounds fall against it.

11. Install grounds bucket liner (supplied). Install grounds bucket behind front flange of rear splash guard. Be sure that the float is inside the bucket.
12. Install overflow bucket against guide on lower left corner of machine. Be sure that the float and overflow hose(s) are inside the bucket.
13. Fill canisters and hoppers with product.
14. Open cup dispenser door and load with cups. Cup dispenser is set for 7 oz. or 8 1/4 oz. cups. If 9 oz. cups are desired, refer to service section for adjustments.
15. Install 24V 'dummy' coin mechanism (and bill validator if so equipped). Connect all harnesses.
- ◆ If the machine was ordered with a factory installed 110v conversion, this will be indicated by the presence of a small box located directly below the coin return well on the interior of the door. **Be sure the correct coin mech and validator are installed.**
16. Access selector assembly by swinging out cup dispenser and lowering logic control and LED board panel. Install price labels on selection labels and insert into appropriate positions. *See Figure 1, page 25.*
17. Install the training template over the selection panel using the directions on the template. *1.01 page 1.05*

**REFER TO AP 203 OPERATING SECTION FOR FURTHER INFORMATION ON STEPS 18 THROUGH 20:**

18. Access MODE 11 using the security key on the inside of the door and check that the configuration and options are set correctly for the machine. Proceed to MODE 13 and set payment options. If discount mode is being used, selections being discounted must be assigned in MODE 14.
- ◆ The correct function of the key switch is: on then off - the key should always be in the position where key can be removed.
19. Set selection prices by accessing MODE 4 and assigning prices to selections. Mild and regular strength beverages are automatically assigned the same price while each strong beverage may be assigned a different price.
- ◆ SETTING PRICES TO 0.00 WILL SET A SELECTION TO FREE VEND.

- ◆ SETTING A PRICE TO 99.99 WILL DISABLE A SELECTION AND CAUSE THE MESSAGE 'MAKE ANOTHER SELECTION' TO APPEAR WHEN THE SELECTION IS PRESSED. THIS IS USEFUL FOR BLOCKING UNUSED SELECTIONS OR DISABLING A SELECTION WHEN IT IS OUT OF ORDER.
20. Adjust commodities for the correct throw by accessing MODE 12 (see below). After confirming that the times for liquids are correct, cup levels should be adjusted using flow restrictor on each commodity valve.
21. After completing the product adjustments, install the commodity chutes. Install the humidity bar (heater) on the canister rack so that the tabs on the humidity bar fit into their respective slots between the canisters. Connect the humidity bar harness to the machine harness (located to the left of the chocolate canister).
22. Install chocolate whipper mixing bowl cover.
23. Test all selections and additives with coins (and bills).

## ADJUSTING COMMODITY AND LIQUID AMOUNTS

Entering MODE 12 provides access to the channels which control the dispense times of all ingredients. The dispense time of each commodity and it's sequence in the vend cycle is controlled by the microprocessor. Precise time adjustments determine the exact amount of ingredients dispensed. This exact time sequence ability enables accuracy to 1/100 of a second.

Each channel (numbered 02 through 71) has up to three separate settings within each channel. The settings are accessed by pressing the start/enter selection. The three settings are **START**, **DURATION** and **MODIFIER**. Each of these settings can be adjusted by increasing or decreasing the digits shown on the scrolling display by pressing the increment digit (coffee strong) or the ~~next~~ digit (coffee regular) buttons. See Timing Chart #1 on page 1.05.

The **START** time of each channel indicates the time each function or commodity begins within each vend cycle. All times are permanently stored to guarantee the correct sequence of operation.

The **DURATION** determines the length of time within the vend cycle that each channel will operate. The amount of ingredient for a medium strength selection is controlled by adjusting the duration. After confirming that the duration for liquids are set correctly, cup levels should be set by adjusting the flow restrictor on the commodity valves.

Some channels have a third setting - a **MODIFIER**. This modifier appears in the scrolling display as a number below 1.00. The **MODIFIER** value is the percentage of increase or

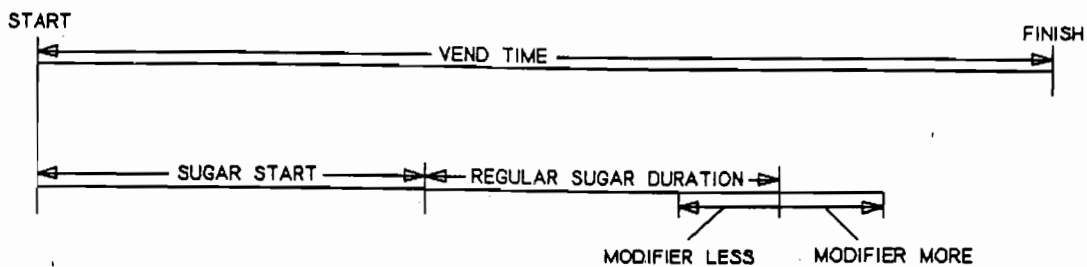
decrease in ingredient throw for a strong or mild selection. For example, a MODIFIER of .25 on channel 15 (brewed coffee-sugar) means that for an extra sugar selection the sugar motor will run 25% longer and for a lesser sugar selection, the motor will run for a period of time that is 25% shorter.

It is important to press **START/ENTER** after changing any one of these settings and returning to **MODE 12** to ensure that all new values are entered.

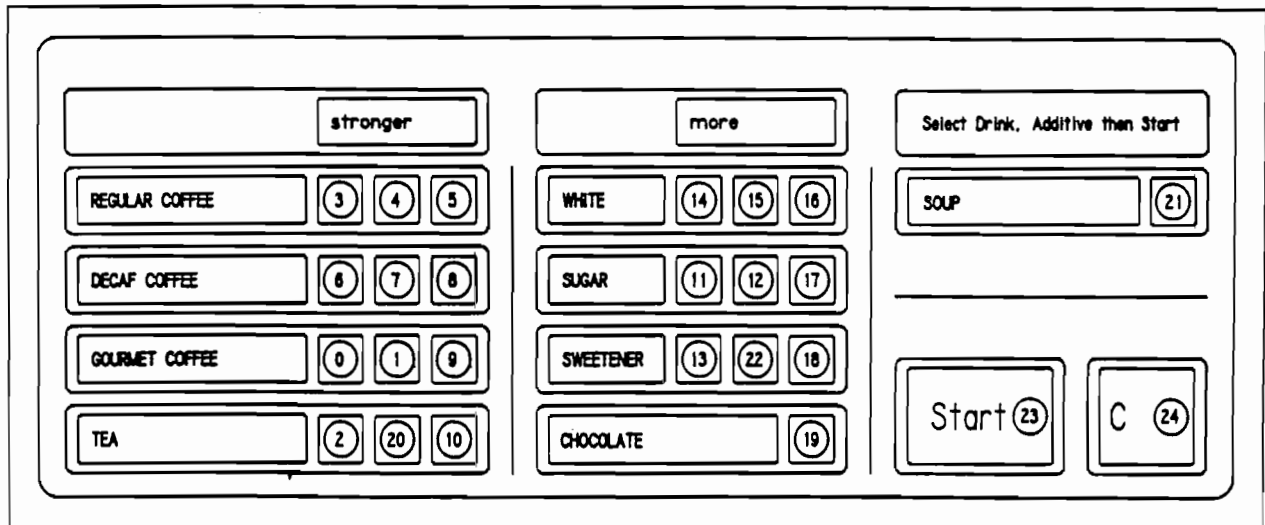
Each channel can be tested by pressing the **MODE 12 CHANNEL TEST** switch (regular lightener).

- ◆ Once the durations for the additives (lightener, sugar, sugar substitute) have been set correctly for the brewed coffee channels, these duration times can be duplicated and entered into the channels for freeze-dried products and tea selections to simplify the set up procedure.
- ◆ Standard times, settings and prices can be reloaded using **MODE 16**. See **MODE 16** for more information.

## TIMING CHART #1



**FIGURE 1.01  
SELECTION LABEL ASSIGNMENTS**



## 203 ELECTRONICS CONTROL SYSTEM - INTRODUCTION

There are 18 modes in which the control system can operate. The various modes are used to access the accountability data, set up the machine and perform service diagnostics.

**Mode 0** - The normal operating mode of the machine during which a user may enter coins or a debit card and select a drink.

**Modes 1 - 10** - Service modes accessible by operation of the "mode" switch inside the machine. This switch is accessible once the door is opened i.e. only the door key is required.

**Modes 11 - 17** - Additional service modes accessible only if a key for the "security" switch is used.

### DESCRIPTION OF MODES

**Mode 0:** Operate mode. Normal operating mode.

#### Door key required:

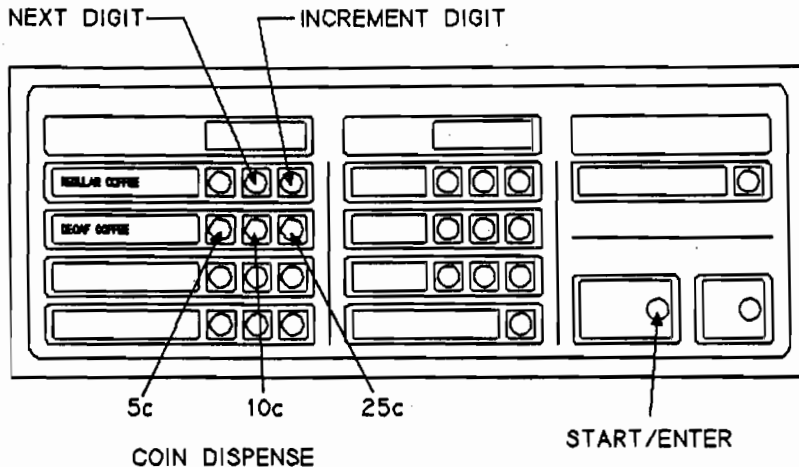
- Mode 1:** Display report. Displays accountability information.
- Mode 2:** Test vend. Allows one test vend without credit.
- Mode 3:** Manual flush cycle. Used to flush the mixing channels and bowls with water.
- Mode 4:** Set cash prices. Used to set/check the cash prices of all selections.
- Mode 5:** Set debit prices. Used to set/check the debit prices of all selections.
- Mode 6:** Diagnostics. Checks all segments of the scrolling display, all indicator lamps and lists closed switches.
- Mode 7:** Channel timed test. Selected channel is turned on for the normal vend duration time.
- Mode 8:** Channel continuous test. Selected channel is manually turned on until is manually turned off again.
- Mode 9:** Upload RS232C. Allows uploading of machine parameters from a programming device to the machine control board.

**Mode 10:** Download RS232C. Allows the downloading of the machine parameters from the control board to a programming device.

#### SECURITY KEY REQUIRED:

- Mode 11:** Machine configuration. Allows definition of machine type and options.
- Mode 12:** Set channel times. Used to set start and duration times and strength modifiers.
- Mode 13:** Set Options. Used to set payment options.
- Mode 14:** Set discount bits. Used to indicate selections to be discounted.
- Mode 15:** Not used on the 203 hot drink machine.
- Mode 16:** Load standard times and prices. Used to load factory standard time settings.
- Mode 17:** Smart display user message. Used to program the scrolling message using the machine keyboard.





## USE OF KEYBOARD

When in any of the service modes the selection panel switches perform different functions. A diagram showing the function of the switches is given in figure 1.

### COIN DISPENSE

At any time, in any service mode, the three switches for decaffeinated coffee can be used to dispense coins from the changer:

Mild strength -	Nickels
Regular strength -	Dimes
Strong -	Quarters

### INCREMENT & NEXT DIGIT

There are two buttons to carry out the changing of modes and values appearing on the scrolling display. Modes can also be incremented using the mode switch, inside the door. The increment digit button (coffee strong) is used to increase the value of the flashing digit e.g. from '13' to '14'. The value of the digit will return to '0' after '9'.

The next digit button (coffee regular) is used to move to the next digit (indicated by the flashing character), like a watch set up, e.g. from '24' to '24' and then to '24'. Repeated pressing will return the flashing digit to the right hand position.

### ENTER

The START selection switch is used as the ENTER button.

## SPECIAL BUTTONS

Additional functions are available with other switches and are explained in the appropriate sections of this manual.

### TO EXIT SERVICE MODE

The service mode can be exited at any time by one of the following:

- Depress mode switch until scrolling message returns.
- Depress coin return button.
- Deposit coins or a bill into the machine.
- Remove and reapply power to machine or control board
- If the machine is left long enough without depressing any switches it will automatically return to the normal operate mode.

## TEMPLATE

A template is provided to simplify the use of the keyboard. When correctly aligned on the selection switch panel it provides the alternate meanings of the switches.

## TRAINING VIDEOTAPE

An introductory video tape (VHS) explaining all the modes and the uses of various switches on the selector panel is available. The AP 203 video tape can be ordered from your distributor or RMI under part number 750142.

## MODE 1 - DISPLAY REPORT

1. Open machine door.
2. Depress the mode switch until the display indicates "MODE 01".
3. Depressing the START front panel selection switch, the display will indicate "M0", followed by "- XXXX". This is the total vend count.
4. Depress the START front panel selection switch again and the display will indicate "M1", followed by "- XXXX.XX". This is the cash total taken by the machine.
5. Depress the START front panel selection switch again and the display will indicate "M2", followed by "- XXXX.XX". This is the cash value of all discounts given.
6. Depress the START front panel selection switch again and the display will indicate "M3", followed by "- XXXX.XX". This is the total value of bills taken.
7. Depress the START front panel selection switch again and the display will indicate "M4", followed by "- XXXX". This is the total number of discount vends.
8. Depress the START front panel selection switch again and the display will indicate "M5", followed by "- XXXX.XX". This is the total value of card vends.
9. Depressing the START front panel selection switch again will cause the machine to display an additional breakdown of the vend totals by price line:
 

"MP01 X.XX" (Price 1) "MC01 XXXX" (Vends for price 1)

"MP10 X.XX" (Price 10) "MC10 XXXX" (Vends for price 10)

"M\$\$" "XXXX" (Cash value of all vends whose prices are not one the 10 specified)

Note: The M\$\$ total does not have a decimal point in the display. The last two digits represent the cents portion of the total.

◆ If multiple price lines are being used - set the most commonly used prices in the lowest possible price line counter. These price line counters are set in MODE 13.
10. Press coin return button to return to operate mode.

Note: The next mode can be entered by either pressing the MODE switch inside the door or by using the increment digit and next digit switches on the selection panel.

The following chart is a graphic representation of the steps for retrieving the accountability information from MODE 1.

**START** MEANS PRESS THE START BUTTON ONCE

	SCROLLING DISPLAY WILL SHOW	EXPLANATION
<b>START</b>	M0 000000	VEND COUNT
<b>START</b>	M1 0000.00	CASH METER
<b>START</b>	M2 0000.00	DISCOUNT CASH METER
<b>START</b>	M3 000000	\$ VALUE OF BILLS ACCEPTED
<b>START</b>	M4 000000	DISCOUNT VEND COUNT
<b>START</b>	M5 0000.00	DEBIT CARD CASH METER
<b>START</b>	MP01 .XX	PRICE 1 VEND PRICE
<b>START</b>	MC01 000000	PRICE 1 VEND COUNT
<b>START</b>	MP02 .XX	PRICE 2 VEND PRICE
<b>START</b>	MC02 000000	PRICE 2 VEND COUNT
	↓ ↓ ↓	
<b>START</b>	MP10 .XX	PRICE 10 VEND PRICE
<b>START</b>	MC10 000000	PRICE 10 VEND COUNT
<b>START</b>	MC\$\$ 0000.00	CASH VALUE OF ANY NON SPECIFIED VEND

## MODE 2 - TEST VEND

1. Open machine door.
2. Depress the mode switch until the display indicates "MODE 02".
3. Depress the START front panel switch, the display should indicate "THANK YOU" and then scroll the user message signifying that the machine is in the normal user mode.
4. The next vend will be a vend without credit.

## MODE 3 - FLUSH CYCLE

1. Open machine door.
2. Depress the mode switch until the display indicates "MODE 03".
3. Depress the START front panel switch. The machine will then show "OPT Y/N". Use the increase digit switch (coffee strong) to change the Y to flashing.
4. Depress the START front panel switch. The machine will then start a series of flush cycles as follows:

Cycle	1	2	3
Chocolate water	Y	Y	Y
Mix. channel water	Y	Y	Y
Brewer water	Y	Y	Y
Soup water	Y	Y	Y

5. Approximate run time for the flush cycle is one and one-half minutes.
6. At the end of the flush cycle the lamp on the cupwell bezel will go out while the display will continue to indicate "MODE 03" and the Y that was changed above will reset to N.

### FLUSH CYCLE SETTINGS

1. The flush cycle is carried out either by operating mode 3 and automatically every 12 hours. The automatic flush will occur as long as the autoflush enable switch is connected to the logic board and the door is closed. The volume of the water dispensed during the flush cycle is preset during manufacture and should not be adjusted. If you experience problems with the cycle contact technical service at RMI.
2. The automatic flush will operate every 12 hours from the last time that the machine was powered up. If the machine is being used at the end of the 12 hour period it will wait for 10 minutes of complete inactivity before carrying out the cycle.
3. This automatic cycle can be disabled by removing the connector from connector P12 on the logic board, beneath the cover on the inside of the door. It will still be possible to carry out a manual flush using mode 3.

## MODE 4 - SET CASH PRICES

1. Open machine door.
  2. Depress the mode switch until the display indicates "MODE 04".
  3. Depress the START front panel switch, the display will indicate "PRICE .00".
  4. Use the next digit to move the blinking cursor to the required digit in the display. To increase the selected digit press the increment digit switch. The value of the digit will return to "0" after "9".
  5. When the desired price has been set on the display, press the "START" switch. The display will then indicate "SELECTION".
  6. Depress the selection switches (normal panel buttons) to assign the set price to the drink selections. The selection LED will light up to indicate that the price has been set. Repeat for all selections at the set price.
  7. Depress the "START" switch and the display will indicate "PRICE . ". To verify the prices depress the appropriate selection switches. The price will be displayed for each selection pressed. The LEDs will remain on until a new mode is entered.
  8. Depress the "START" switch and the display will return to "MODE 04".
- ◆ SETTING PRICES TO 0.00 WILL SET A SELECTION TO FREE VEND.
  - ◆ SETTING A PRICE TO 99.99 WILL DISABLE A SELECTION AND CAUSE THE MESSAGE "MAKE ANOTHER SELECTION" TO APPEAR WHEN THE SELECTION IS PRESSED. THIS IS USEFUL FOR BLOCKING UNUSED SELECTIONS OR DISABLING A SELECTION WHEN IT IS OUT OF ORDER.

## MODE 5 - SET DEBIT PRICES

This mode is used to set the prices to be used by a debit card reader. They are a completely separate set of prices from the cash prices. Both cash and debit operation can be available at the same time on the machine. The procedures are identical to MODE 4.

## MODE 6 - DIAGNOSTICS

1. Open machine door.
2. Depress the mode switch until the display indicates 'MODE 06'.
3. Depress the START front panel switch. The scrolling display will have all segments on and all LEDs will be illuminated until MODE 6 is exited.
4. The display will then indicate all the closed switches by switch number, one after another. This facility, along with the list of switches, can be used to locate problems in the machine. See the troubleshooting section in the service section of the manual.
5. At the end of the diagnostics the display will indicate 'MODE 06'.

## MODE 7 - CHANNEL TIMED TEST

1. Open machine door.
2. Depress the mode switch until the display indicates 'MODE 07'.
3. Depress the START front panel switch. The display will indicate 'CH 00'.
4. To select a channel use the next digit switch and increment digit switches to select the desired channel number.
5. Depress the START switch and the selected channel will operate for the normal vend duration time.
6. When the selected channel is finished the display will indicate 'MODE 07'. See Appendix IV - Heater Circuit.

## MODE 8 - CHANNEL CONTINUOUS TEST

1. Open machine door.
2. Depress the mode switch until the display indicates 'MODE 08'.
3. Depress the START front panel switch. The display will indicate 'CH 00'.
4. To select a channel use the next digit switch and increment digit switches to select the desired channel number.

5. Depress the START switch and the selected channel will be turned on. It will stay on until the START switch is depressed again. The display will then indicate 'MODE 08'. See Appendix IV - Heater Circuit.

Note: See the troubleshooting section for additional uses of mode 8.

## MODE 9-UPLOAD SETTINGS TO MACHINE

Note: At present the only device capable of being used to upload data to the machine is an IBM compatible computer or another machine.

1. Open machine door.
2. Depress the mode switch until the display indicates 'MODE 09'.
3. Connect the programming device cable to P2 on the control board.
4. Depress the START switch before sending the file to the machine control board.
5. The display will remain blank during the file loading time. At the end of the file loading the user message will scroll on the display again.

## MODE 10-DOWNLOAD SETTINGS FROM MACHINE

Note: At present the only device capable of being used to download data from the machine is an IBM compatible computer or another machine.

1. Open machine door.
2. Depress the mode switch until the display indicates 'MODE 10'.
3. Connect the programming device cable to P2 on the control board.
4. Depress the START switch. This starts sending the file to the external programming device.
5. The display will remain blank during the file sending time. At the end of the file sending the user message will scroll on the display again.

## MACHINE TO MACHINE UPLOAD/DOWNLOAD

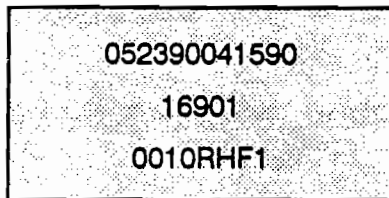
It is also possible to transfer the settings and data from one machine to another, using a special connecting cable (part # 33784). The procedure is as follows:

1. Connect each end of the cable to the two P2 connectors on each machine control board.
  2. Set machine which has already been set up correctly (machine A), into mode 10.
  3. Set machine to be set up (machine B) into mode 9. Machine B needs to be in an in order condition to receive the download. Depress the START switch.
  4. Depress the START switch on machine A.
  5. The scrolling display will go blank on machine B. When the scrolling display returns the file transfer is complete.
- ◆ Due to the complexity of the information that is transferred during the upload or download, some precautions must be observed. The information that is required is located on the paper label on the main program chip located on the logic board. The diagram below explains the information contained on the label.

DATE CODE -

ORDER # -

CHART # -



- ◆ If the first date code is 05/23/90 or higher, then only the first three numbers in the chart # in both machines must match for a successful transfer.
- ◆ If the first date code is 02/28/90 or earlier then all eight digits must match exactly for a successful transfer.

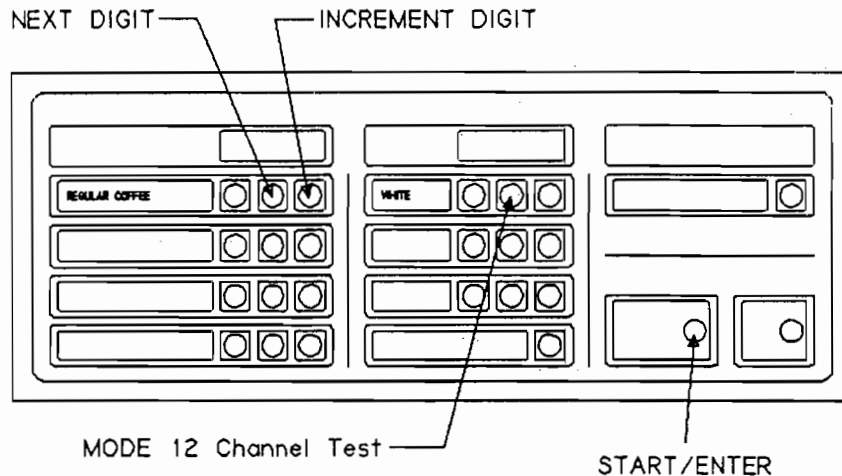
## MODE 11 - MACHINE CONFIGURATION

1. Open machine door.
2. Insert security key into the service key switch, turn the switch to the 'on' position and then back to the 'off' position. This allows the key to be removed and prevent it being left in the machine in error.
  - ◆ The correct function of the key switch is: on then off - the key should always be in the position where key can be removed.
3. The display should indicate 'MODE 11'.
4. Depress the START switch. The display will indicate 'CONFIG H/B/C'. The 'H' should be flashing to indicate that the machine is set up as a 203 hot drink machine.
5. If the 'H' is not flashing, after having just installed a new control board for example, press the change digit switch until it is. Then depress the START switch. The machine will then jump automatically to mode 16 to load the default values appropriate for the 203 machine (see MODE 16).
6. If the 'H' was flashing correctly continue with the configuration by depressing the START switch.
7. The machine will then advance through a series of four questions. Each selection is made by depressing the change digit switch until the 'Y' (yes) or 'N' (no) is flashing and then activating the selection by depressing the START switch. The flashing character indicates the selected choice. The following questions are indicated on the display:

	FLASHING Y	FLASHING N
'OPT 1 Y/N'	Brewed regular coffee	No brewer-FD coffee
'OPT 2 Y/N'	Brewed decaf coffee	No brewer-FD decaf.
'OPT 3 Y/N'	Espresso	Soup
'OPT 4 Y/N'	Fresh brewed tea	FD tea or no tea

8. When the START switch is pressed for the final question the display will indicate 'MODE 11'.

Note: It is important to return to the 'MODE 11' on the display to ensure that the new values are loaded.



## MODE 12 - SET TIME CHANNELS

1. Open machine door.
2. Insert security key into the service key switch, turn the switch to the 'on' position and then back to the 'off' position.
3. Depress the mode switch until the display indicates 'MODE 12'.
4. Depress the START switch. The display will indicate 'CH 00'.
5. To select a channel use the next digit switch and increment digit switches to select the desired channel number. See figure above for location of switches.
6. Depress the START switch and the start time will be displayed in the following format - 'START 00.0'. This is the time from the beginning of the vend cycle to when the channel starts.
7. To change the start time the next digit switch can be depressed to move the flashing character to the digit to be changed and the increment digit switch depressed to increase the value of the digit.
8. When the required start time has been set, depress the START switch. This will change the previous start time to the new start time and advance to display the duration time. The display will be in the following format -  
 'DUR 00.00'.
9. The duration time can be changed by use of the next digit and increment digit switches.
10. When the required duration time has been set, depress the START switch. The new duration time will replace

the old time. If the channel has a modifier the display will indicate 'MOD 0.00'. If there is no modifier the display will indicate 'MODE 12'.

11. The duration sets the ingredient throw for the medium strength of selection e.g. regular coffee. The modifier value is the percentage increase and decrease in ingredient throw for the strong and weak selections on the selection panel. The modifier is set by means of the next digit and increment digit switches. By depressing the START switch the new modifier will replace old one. The display will then indicate 'MODE 12'.
  12. The selected channel can be tested by depressing the CHANNEL TEST switch (regular white). The channel will be turned on for the normal vend duration. The display will indicate 'MODE 12'.
- ◆ Each channel to be tested must be 'ENTERED' before it is tested - otherwise the test will return to the last channel tested.

Note: It is important to return to the 'MODE 12' on the display to ensure that the new values are loaded.

## MODE 13 - SET OPTIONS

1. Open machine door.
2. Insert security key into the service key switch, turn the switch to the 'on' position and then back to the 'off' position.
3. The display should indicate 'MODE 13'.
4. Depress the **START** switch. The machine will then advance through a series of questions and options. Each Y/N selection is made by depressing the **change digit** switch until the 'Y' (yes) or 'N' (no) is flashing and then activating the selection by depressing the **START** switch. The following questions are indicated on the display:

'FORCE Y/N' - Y - Forced i.e. User must make a vend before change is returned  
N - Normal

'FREE Y/N' - Y - Free vend enabled on all selections  
N - Normal prices apply

'MS1600 Y/N' - Y - European Executive changer installed  
N - US changer installed

'ESCROW Y/N' - Y - Bill validator will escrow any bill that takes the credit above the vend price. No further bills will then be accepted. If the coin reject is pressed the bill will be returned.  
N - Bills are stacked immediately.

'MULTI Y/N' - Y - More than one vend can be made before change is returned.  
N - Single vend - Change is returned immediately.

'DISC .00' Any selection set up to have a discount (see mode 14) will be discounted by the factor set in this display. The discount price is obtained by multiplying the vend price by the discount factor e.g. 50¢ x .80 = 40¢. The discounted price will be in effect when the discount switch is operated.

'FREE CT 00' - This option allows a free drink after a given number of vends. The number in the display can be set between '01' (every vend) and '255' (every 255th vend is free). If the number is left at '00' no free vends will be given.

'VOLUME .00' Not used on the 203 hot drink machine.

'VOL D .00' Not used on the 203 hot drink machine.

5. Depress the **START** switch. The display will indicate 'PRICE1 .XX'. This is the price setting for the first price line. There are ten price lines that can be set to the required values. The control will then increment the count every time a vend is made at that price (or an equivalent price obtained by discounting a higher price).
6. Set the required price using the **Increment digit** and **next digit** buttons.
7. Depressing the **START** switch will increment through the 10 price line values:

'PRICE2 .XX'

'PRICE9 .XX'

'PRICE0 .XX'

Each price line can be set to a different value. Set any unused prices to .00.

8. Depressing the **START** switch completes the selection and returns to the beginning of the mode. The display will indicate 'MODE 13'.

Note: It is important to return to the 'MODE 13' on the display to ensure that the new values are loaded.

- ♦ The first available price line set to .00 will record all **MODE 2** test vends, all 100% discount vends and all **FREE CT** (winner) vends.

## MODE 14 - SET DISCOUNT BITS

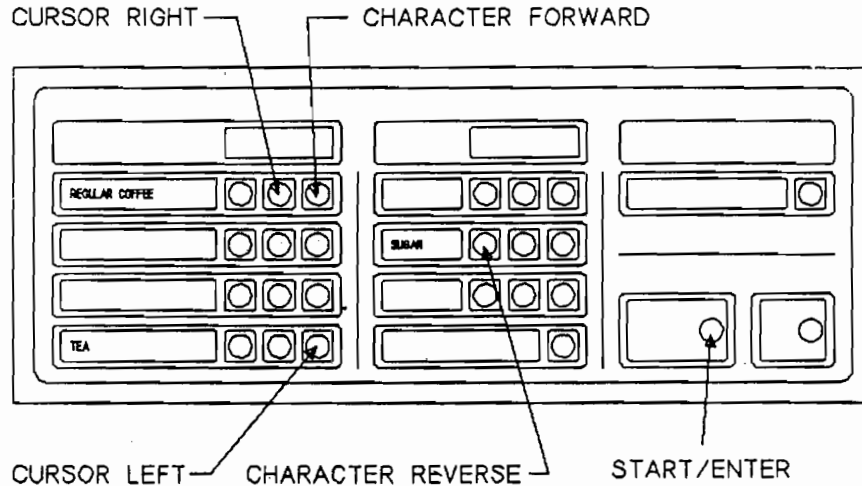
1. Open machine door.
  2. Insert security key into the service key switch, turn the switch to the 'on' position and then back to the 'off' position.
  3. Depress the mode switch until the display indicates 'MODE 14'.
  4. Depress the **START** switch. The display will indicate 'SELECTION'.
  5. All previously set discounts will be reset. Depress the selection switches (normal panel buttons) to change the drink selections to 'discount. The selection LED will light up to indicate that it is discounted. If the selection is pressed again the LED will go out again to indicate that it is not discounted.
  6. Depress the **START** to complete the selection. The display will indicate 'MODE 14'.  
  
**NOTE:** Changing the options in **MODE 11** may require resetting the discount assignments.
- ◆ Entering **MODE 14** and pressing **START** twice will clear all selections previously set for discount.

## **MODE 15 - NOT USED ON THE 203 HOT DRINK MACHINE**

## MODE 16 - LOAD STANDARD SETTINGS

1. Open machine door.
2. Insert security key into the service key switch, turn the switch to the 'on' position and then back to the 'off' position.
3. Depress the mode switch until the display indicates 'MODE 16'.
4. Depress the **START** switch and the display will indicate 'MODE 16' again.
5. In order to prevent accidental loading of the standard times and settings, it is necessary to enter a code number or password. Using the **Increment digit** and **next digit** switches change the '16' to '27' and then depress the **START** switch. The display will go blank.  
  
◆ Changing the '16' to a '27' should be considered a password that is the only way to reload the factory standard times. To confirm that **MODE 16** was properly done turn power off and back on. If configuration and the values in **MODES 11,12** and **13** remain the same, then the reload was correctly done.
6. When initialization and loading of the standard values is complete the display will scroll the user message again.
7. Return to mode 11, recheck configuration and set the machine options.  
  
◆ If you have been supplied with a 'CUSTOM CHIP' (indicated by a F in the fourth position of the of the **CHART #** as shown in the diagram on the page describing the EPROM label) you are reloading the times and settings provided when the 'CUSTOM CHIP' was created.





## MODE 17 - PROGRAMMING USER MESSAGE

1. Open machine door.
  2. Insert security key into the service key switch, turn the switch to the "on" position and then back to the "off" position.
  3. Depress the mode switch until the display indicates "MODE 17".
  4. Depress the **START** switch. The first nine characters of the user message will be displayed with the cursor (flashing character) at position eight and a special start character (  $\boxtimes$  ) at position one.
  5. The message can now be changed by moving through the message to the characters that need changing and then selecting from the list of characters and symbols.
  6. **CURSOR RIGHT** -  
Switch "A" (coffee regular) moves the cursor to the right in the message. Depressing switch "A" for less than one second will move the cursor right one character at a time. If depressed longer the rate of movement will speed up.
  7. **CURSOR LEFT** -  
Switch "B" (tea strong) moves the cursor to the left in the message. Depressing switch "B" for less than one second will move the cursor left one character at a time. If depressed longer the rate of movement will speed up.
  8. **CHARACTER FORWARD** -  
Switch "C" (coffee strong) controls the characters at the cursor location. Depressing switch "C" for less than one second will move forward through the character set one character at a time. If depressed longer the rate of movement will speed up. When a character has been correctly set simply move on to the next character.
  9. **CHARACTER REVERSE** -  
Switch "D" (sugar weak) also controls the characters at the cursor location. Depressing switch "D" for less than one second will move backward through the character set one character at a time. If depressed longer the rate of movement will speed up.
  10. The (  $\boxtimes$  ) character indicates the left and right boundaries of the user message.
  11. The (  $\boxdot$  ) character must be entered to indicate the end of message to be displayed. Otherwise the display message would ignore the boundary character and may scroll some characters that do not belong to the character set.
  12. The message program mode should be exited by depressing the mode switch only.
  13. **VALID CHARACTER SET** -  
The following characters are available:  
  
A through Z  
0 through 9  
  
\$ ' < > \* + , - . / ?  $\boxtimes$   
A blank is represented by a flashing underline \_
- ♦ Approximately 85 spaces including blanks and punctuation are available for a user message to be loaded into the scrolling display. For best results leave 5-6 spaces blank at the beginning of your message. Doublecheck for correct spelling - errors in the middle of the message are difficult to correct.

## APPENDIX I: 203 MACHINE - CHANNEL NUMBERS & STANDARD TIMES

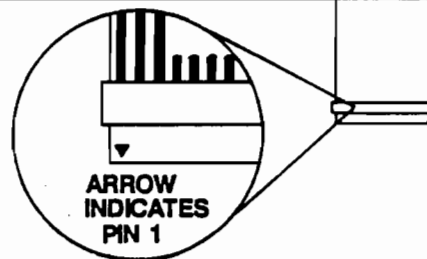
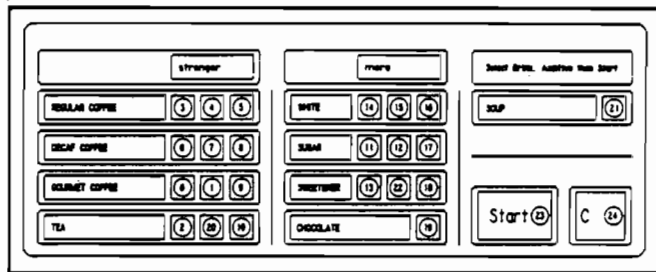
NOTE: Times shown below are for standard 7 oz. vend

CHANNEL #	DESCRIPTION	START	DURATION	MODIFIER	CUSTOMER SETTINGS		
					S	D	M
02	Vend time	0.0	25.00				
03	Cup drop	0.0	1.40				
04	Large grinder - reg.	0.0	0.75	0.25			
06	Loose Ground - reg coffee	0.0	1.35	0.25			
07	LG/small grinder - decaf	0.0	1.30	0.25			
08	Brew motor - coffee	3.0	22.00				
09	Water - coffee brew	4.1	1.90				
10	Water - coffee brew espresso	4.1	1.11				
11	Open cylinder delay - coffee brewer	7.4	1.00	0.00			
12	Pressure relief delay - coffee brew	14.0	2.00				
13	Make up water - coffee brew	12.0	2.30				
14	Whitener auger - coffee brew	13.0	0.90	0.30			
15	Sugar auger - coffee brew	12.0	2.21	0.15			
16	Sugar substitute auger - coffee brew	12.0	0.40	0.25			
17	Whipper - coffee brew espresso	8.6	10.00				
18	Water - FD coffee	2.8	6.00				
19	Water - FD tea (version 2 yellow)	2.8	6.00				
20	Regular coffee FD auger	5.8	2.80	0.25			
21	Decaf FD auger	5.8	2.80	0.25			
22	Coffee FD gourmet auger	5.8	2.80	0.25			
23	Whitener auger - coffee FD	5.8	0.90	0.30			
24	Sugar auger - coffee FD	5.8	2.50	0.15			
25	Sugar substitute auger - coffee FD	5.8	0.40	0.25			
26	Water - tea brew	0.5	8.80				
27	Tea FD auger	5.8	1.50	0.15			
28	Tea brew auger	0.5	0.25	0.15			
29	Brewer motor - tea	15.0	1.75				
30	Whitener auger - tea FD	5.8	0.40	0.30			
31	Sugar auger - tea FD	5.8	2.00	0.15			
32	Sugar substitute auger - tea FD	5.8	0.90	0.25			
33	Water/whipper - chocolate	1.0	5.00				
34	Chocolate auger	2.0	3.86				
35	Water/whipper - soup	1.0	7.20				
36	Soup auger	2.0	4.60				
37	Water - white espresso	7.5	1.50	0.25			
38	White auger - espresso	9.0	1.20	0.25			
39	Clean cycle - total time	0.0	25.00	*			
40	Clean cycle water - soup	12.0	4.00	*			
53	Clean water - chocolate	20.0	4.00	*			
56	Whipper - coffee brew	8.6	0.00				
57	Whipper - coffee FD	6.0	0.00				
60	Clean water FD	17.0	2.00	*			
61	Clean cycle water - coffee brew	5.0	2.50	*			
62	Clean cycle water - tea brew	16.7	0.10	*			
63	Clean cycle water - tea brew	0.0	1.75	*			
64	Clean cycle water - coffee brew	2.0	22.00	*			
65	Clean cycle - coffee whipper	8.0	2.00	*			
66	White auger - tea brew	4.5	0.40	0.30			
67	Sugar auger - tea brew	2.5	2.00	0.15			
68	Sugar substitute auger - tea brew	2.5	0.90	0.25			
71	Whipper - gourmet coffee	6.0	0.00				

\* Denotes cleaning cycle channels

## APPENDIX II: 203 SWITCH NUMBERS

Switch #	Description	Selector membrane switch terminals
00	Gourmet, low (Selection panel)	1 & 2
01	Gourmet, medium	1 & 3
02	Tea, low	1 & 4
03	Coffee, low	1 & 5
04	Coffee, medium	1 & 6
05	Coffee, high	1 & 7
06	Decafe, low	1 & 8
07	Decafe, medium	1 & 9
08	Decafe, high	10 & 11
09	Gourmet, high	10 & 12
10	Tea, high	10 & 13
11	Sugar, low	10 & 14
12	Sugar, medium	10 & 15
13	Sugar sub, low	10 & 16
14	White, low	10 & 17
15	White, medium	10 & 18
16	White, high	19 & 20
17	Sugar, high	19 & 21
18	Sugar sub, high	19 & 22
19	Chocolate	19 & 23
20	Tea, medium	19 & 24
21	Soup	19 & 25
22	Sugar sub, medium	19 & 26
23	Start	19 & 27
24	Cancel	28 & 29
25	Discount vend	
26	Flush interlock	
27	Waste and grounds bucket-AC Present	
28	Cup present	
29	Security key	
30	Mode	
31	-	
32	-	
33	Brewer water	
34	Brewer cycle	
35	Brewer delay	
36	Heater thermostat #1	
37	Heater thermostat #2	}Logic level thermostats only See Appendix IV
38	-	
39	Water present - Float (Version 1)	
40	Water present - Probe (Version 2 - See pg 3.20)	



## TROUBLESHOOTING FOR AP 203 HOT DRINK MACHINE

If **START/ENTER** does not operate- check security key switch for correct position. Key should be able to be removed. If key cannot be removed, then security key switch is on and the **START/ENTER** switch is disabled.

If **MODE** switch does not operate, check P11, P13 and P16 on the logic control board to determine if the **MODE** switch is reversed with the **DISCOUNT** switch or the **CUP PRESENT** switch. The **MODE** switch should be connected to P16. The **CUP PRESENT** switch should be connected to P13

If scrolling display on door shows **'OUT OF ORDER'**: Refer to Appendix III-OUT OF ORDER CODES and check the three obvious reasons for the **OUT OF ORDER** message:

- 1) Buckets are full - **CODE M20**
- 2) Water tank is not full - **CODE M02**
- 3) Machine is out of cups - **CODE M01**

If either the water inlet valve or the cup spiral motor have been on for 90 continuous seconds the **OUT OF ORDER** message will appear. Another cause for the **OUT OF ORDER** message could be a constant low voltage source (ie-below 104Vac) from the wall outlet supplying the machine.

During initial set-up two other situations may occur:

- 1) Until the front thermostat has cycled off once after initial power up, the machine will not allow a vend to occur to prevent delivery of a cold cup. This may be temporarily defeated by removing and reconnecting either wire from the front thermostat to simulate the thermostat being satisfied. This applies only to LOGIC LEVEL THERMO-STATS. See Appendix IV.
- 2) If a logic board was changed or the software was changed, it may be necessary to proceed to **MODE 16** and reload the standard times. Caution should be observed because activating **MODE 16** will cause any channel time or price information that was changed from the standards to be lost. Further information on **MODE 16** can be obtained in the description of modes.
- ♦ If a logic board or software chip has been replaced and the board or chip is configured as a cold drink, the large grinder will immediately start to run. Swing the grinder swingout bracket out to interrupt power to the grinder and check **MODE 11** for the correct configuration ("H" flashing). Change the configuration and reload the factory standard times and settings in **MODE 16**.

Using the black mode switch located on inside of the door, set the display to **MODE 6** and press **START** button and check the list of switches that will appear on the display for the following switches and their correct operating position.

This list of switches can be used to check each switch that functions as a sensor for the logic board. After running **MODE 6** test the first time and noting each switch number that appears, any switches' position can be physically changed to determine if the switch and its wiring to the logic board are correct. See Appendix I for membrane switch locations.

SWITCH #	INDICATION	WILL APPEAR IN NORMAL OPERATION
24 or below	faulty membrane (selector)	N
25	discount switch	Y/N
26	auto flush enable switch	Y/N
27	bucket switch activated	N
28	cups present	Y
33	brewer water switch	Y
34	brewer cycle switch	Y
35	brewer delay switch	N
36	front thermostat	Y/N
37	rear thermostat	Y/N
39	water inlet switch	Y
40	tank probe (ELLC)	N

(See Version 2 software  
on next page)

**EXAMPLE:** Switch 39 (water present or float switch) will show in **MODE 6** normally. After disabling the water inlet valve and running water out of the tank via the rinse hose so the float drops and the switch arm drops, press **START** again to run another test. This time switch 39 should not appear. This proves that the switch, the wiring from the switch to the logic board, and the sensor circuit on the logic board are functioning correctly. A similar test for any of the other switches can be devised.

After determining that the switches function correctly and a problem can be traced to a specific channel or device, the following procedure should be used to locate the source of the problem.

Check **MODE 11** to confirm that the correct options are set for the machine (Y/N).

Visually inspect all connectors and terminals for any pins that have become loose or backed out of the connectors themselves. Also confirm that the numbers on the wires correspond to the correct pin numbers.

Check the timing chart for the specific channel involved.

Confirm the start and duration settings for the appropriate channel are correct by using the security key and accessing **MODE 12**. Check the times and run a channel test (after returning to **MODE 12**) by pressing the regular lightener selection. If the specific channel does not operate with the

MODE 12 test, proceed to MODE 8 and select the faulty channel and press the START button. Once START is pushed, the function or device will have power applied to it and the problem can be located by using a voltmeter starting at the correct connector pins on the motor control board. The connectors must remain on the board to provide a load. If no voltage appears between the pin (determined by referring to the wiring diagram) and neutral (blue wire) then the problem is probably located in the motor control board. If voltage is present at the pins on the motor control board, then the problem is located downstream of the motor control board (ie. between the motor control board and the device itself).

## VERSION 2 SOFTWARE CHANGES

Effective the week of 4/15/91, S/N 39402, a number of changes to the 203 have been made. The primary change is a change to Version 2 software. Version 2 software chips can be identified by observing the chart number on the bottom line of the paper label. The first three digits should be 002. The following information details these changes.

Main EPROM on logic board changes to version 2 software. This version provides corrections for all known errors plus the replacement of the heater tank float with an Electronic Liquid Level Control. This requires that a separate harness is used to connect the probe for the ELLC to the logic board. All model 203 manufactured after 12/3/90 S/N 37785 with the new style harness have the wires included to connect the probe to the logic board. Older machines can be retrofitted with the additional harness to replace the float with a ELLC probe by using kit # 35335. Version 2 logic boards cannot replace a version 1 logic board unless the tank harness and software are changed. A new part number is used to identify the correct spare parts replacement logic board. P/N 31800-V2 indicates a version 2 logic board. Two labels will be placed in each machine to identify the presence of a version 2 logic board. One label will be located on the schematic on the cup wrapper door and the other will be placed on the logic board connection label located on the back of the LED panel.

The change to an Electronic Liquid Level Control (ELLC) causes the switch numbers that appear in MODE 6 to change. Switch 39, formerly the water level switch is no longer used and does not appear. Switch 40 now reflects the condition of the ELLC, and will only appear when the tank is calling for water. The probe is connected to P7 on the logic board.

Version 2 software also changes the use and the name of the strength delay. Testing has shown that moving the strength delay towards the beginning of the cycle and using it to delay the piston moving down allows more brew water to be added and less bypass water to be used. This also allows for longer water to coffee contact time for increased extraction and provides less back pressure in the cylinder by allowing a

degassing period. To do this, a change in the position of the third cam so the switch is in the valley of the cam at standby, and rides up on the high side of the switch during brew cycle, causes a change in the wiring of the delay switch and retiming channel 11 is necessary. These changes cause the brewer to pause while the piston is in the open (up) position. Because this change affects the assembly of the brewer, a new part number is used for a complete version 2 brewer. The fixed times listed in the table below are used in version 2 software to allow all the brew water to be added through the brewer. All brew water is controlled by channel 9.

### CHANNEL PRESET FOR VERSION 2

CHANNEL	11	11	13
CUP SIZE	START	DUR	DUR
7oz	7.4	1.00	0.00
8¼oz	7.4	1.50	0.00
9oz	7.4	2.00	0.00
12oz	7.4	3.30	0.00

We have also changed the soup motor from 90 rpm to 180 rpm. This change allows placement of specialty coffees in soup position without changing the motor. Additional flexibility can be gained by exchanging the soup and sanko motors to place GFIC in sanko and retiming the appropriate channels.

### VERSION 2 SOFTWARE WITH YELLOW LABEL

Effective in November 1991, the label on the software EEPROM will change to a yellow label to indicate a small change. This change reassigns channel 19 from "Water - espresso coffee FD" to "Water - FD tea" to allow for more flexibility when using a speciality coffee in the FD/gourmet position by splitting the channels that control the trough delivery valve. This change is compatible with all existing version 2 boards by entering the same duration from channel 18 to channel 19. See Appendix I, pg 2.11.

## 203 TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE	REMEDY
Scrolling Display is Blank	Press any prime selection Does any selection LED come on?	YES-with any message proceed to MODE 17 to see if any user message is loaded  YES-with no message- check ribbon cable from LCB to scrolling display to confirm that the cable is connected correctly. Confirm that a language chip is installed.  NO Proceed to troubleshooting section regarding no power to machine.
	Water tank not full CODE M02	Check inlet water valves. Power down-power up control circuit breaker to reset 90 second safety timer. Check for clogged water filter  Check water supply for minimum incoming water pressure
	Buckets are full CODE M20	Check bucket switches for correct operation. Measure MCB P7-4&6 for -6.5Vdc. If 0Vdc is measured-bucket circuit is activated.
Scrolling display shows: OUT OF ORDER	No cups CODE M01	Check cups and cup present switch for correct adjustment. Power down-power up control circuit breaker to reset 30 second timer to allow spiral motor to run.
	Water not hot CODE M04 See Appendix IV	Front thermostat has not been satisfied since initial power up- disconnect and reconnect one wire from front thermostat to simulate the thermostat being satisfied.
	Low supply voltage (115Vac) CODE M20	Check wall outlet for 115Vac $\pm$ 10%
	Software or logic board has been replaced-CODE M10	Check configuration in MODE 11 and reload MODE 16. Return to MODE 11 and recheck configuration and options

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Scrolling display shows: PLEASE WAIT	Water is not hot enough See Appendix IV	Front thermostat has not been satisfied since initial power up- disconnect and reconnect one wire from front thermostat to simulate the thermostat being satisfied.
No power-complete machine including fluorescent light and service outlet	Power cord unplugged	Plug in power cord
	Loose or broken wire in power cord	Repair or replace
	Bad connections in power cord to EMI filter and switch panel	Check all terminals
	No voltage from wall outlet	Check outlet and supply circuit breaker
	On/off switch or wiring defective or open	Repair or replace
Machine will not vend or accept money	Circuit breaker(s) tripped	Reset or replace
	Power transformer disconnected or defective	Repair or replace Check MCB P1-3 and P1-5 for 24Vac
	Defective coin mechanism	Replace or disconnect and test machine using MODE 2
	MODE 13-MS1600 option is Y	Change to N
Start/Enter does not operate	Security key switch is on	Key cannot be removed-return to off so key can be removed
Bottom heater comes on first during initial power up	110Vac hot reversed at MCB	Check MCB P8-1&3 reversed P8-1 top heater P8-3 bottom heater
Excessive amount of liquid in overflow bucket	Water present (float) switch defective or out of adjustment	Adjust or replace switch
	Float waterlogged	Replace float
	Commodity water valve leaking	Repair or replace
	Water inlet valve leaking	Repair or replace-check supply line for high pressure. Install pressure regulator to correct.
	Flush cycle activating every 12 hours	Disable or reduce flush cycle or service machine more frequently

<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Lightener and/or sugar not selected but appearing in drink	Clogged exhaust system	Check steam exhaust (duct,hose,fan and humidity bar)-clean as needed
	Exhaust motor not running	Service or replace
	Scratched or defective trough causing poor wash	Replace
	Mixed products in canisters	Dump products and replace
Wet grounds dispensed from brewer	Clogged brew filter	Replace
	Clogged filter support screen	Clean or replace
	Scored or cracked brew cylinder	Replace
	Worn or defective piston or seal	Replace
	Incorrect grind of coffee	Check grinder setting and refer to zero adjustment procedure
	Check gram throw	Using gram scale, adjust correct channels
	Soft water or coffee gases causing excessive pressure in brewer	Refer to Brewer section in manual
	Neutral for swing out bracket reversed	Check P10 and P11 on MCB 115Vac hot on P10-1 and P11-1 115Vac neutral on P10-2 and P11-2.
Large grinder operates, small grinder or decaf auger does not	Check configuration MODE 11-Option 2	Option 2 should be Y
	<b>CONFIGURATION AND OPTIONS</b>	
Regular coffee brewer does not operate	<b>CHECK MODE 11 OPTIONS</b> Check canister rack motors for correct electrical connections	Option 1 should read Y
FD regular coffee does not operate		Option 1 should read N
Decaf brewer does not operate		Option 2 should read Y
Decaf brewer does operate and shouldn't		Option 2 should read N
Soup does not operate		Option 3 should read N
FD tea does not operate		Option 4 should read N
Weak and/or cold coffee and overflowing cup	Improper gram throw or grind	Check gram throw and grinder setting
	Brew water valve leaking	Repair or replace vaive



<b>PROBLEM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Weak and/or cold coffee and overfilling cup	Defective thermostat	Replace
	Defective heater	Replace
	Incorrect alignment of brew chamber and filter	Adjust stop position of brewer-check brewer motor brake arm for coasting
Cup occasionally not full (Short cup)	Float rod sticking or bent	Straighten or replace
	Water inlet switch sticking or defective	Replace
	Float rod access cover loose	Secure in proper position
	Water valves opening late due to mechanical defect or low voltage	Repair or replace valve
	Brewer cable not adjusted properly causing brewer leak	Adjust cable
	Brewer stop position incorrect trapping grounds on seal	Adjust front brewer cam for correct stop position
	Check brew chamber seal for excessive grounds	Check for proper alignment of coffee delivery chute
	Clogged water filter	Replace
	Low water supply or damaged supply line	Change water supply or replace water supply line
	Incorrect cylinder and carriage alignment	Check brewer cable adjustment
Grounds in cup	Brewer dumping wet grounds	See wet grounds section
	Torn or ripped brew filter	Replace
	Missing funnel cover	Replace
Water only-No coffee	Carriage wiper binding on filter	Confirm that brew filter is seated correctly Clean brew base assembly
	Warped brew filter	Replace
	Bent filter support screen	Replace
	LG canister tunneling	Solenoid defective or disconnected Auger or agitator inoperative
	Bean hopper sliding gate closed	Open sliding gate

PROBLEM	POSSIBLE CAUSE	REMEDY
Water only-No coffee (continued)	Faulty interlock switch or assembly	Adjust or replace
	No coffee in canister	Service
	Check channels in MODE 12 for correct times	See timing chart
Water in grounds bucket	Brew water valve leaking	Repair or replace valve
	Defective piston seal (wet grounds)	Replace
	Incorrect cylinder and carriage alignment	Check brewer cable adjustment
Brewer leaking	Refer to brewer section in service manual	Soft water or coffee gases causing stalling or excessive pressure
	Excessive amount of coffee grounds on brew base assembly	Clean or service
	Cracked or damaged brew cylinder	Replace
	Special washers missing from between brew cylinder and cylinder rods	Replace
	Worn or damaged brew chamber seal	Replace
	Cracked or damaged brew chamber	Replace
	Worn filter or seal	Replace
	Cracked or damaged brew carriage	Replace
	Brew filter support bracket broken	Replace
	Improper brew cable adjustment	Adjust
	Funnel support brace bowed	Replace brew base frame
	Worn or broken delivery funnel	Replace
	Brew base assembly-parts worn or broken (springs, pawls,etc)	Replace parts
	No cups	Cups jammed together in cup cabinet
Wrong type cups or cup ring		Replace cups or cup ring
Defective cup drop motor		Replace
USE YOUR OWN CUP option not working		Cupwell not aligned correctly Sensors blocked or dirty Sensors or board malfunctioning See Service Section, page 3.12

PROBLEM	POSSIBLE CAUSE	REMEDY
Multiple or intermittent cups	Cup motor cycle switch out of adjustment, broken or defective	Adjust or replace
	Cup motor brake arm sticking on causing motor to coast	Check for rubber tip on brake arm-repair or replace
	Cup drop motor start pulse too long	Check MODE 12,channel 3 for correct duration
	Cup motor cycle switch wiring reversed	Correct wiring
Selection or additive not working	Security key switch on	Key cannot be removed-return to off so key can be removed
	Canister empty	Service machine
	Selection not activated	Check MODE 11 options
	Canister rack motors not wired correctly	Correct wiring
	Defective selection membrane or LED board	Does selection beep when pressed? Yes-replace LED board No-Replace selection membrane
Machine vending with no money or returning money deposited and vending	Discount switch on with discount % set at 100%	Turn off discount switch
	Discount switch does not turn off free vending	Check for correct wiring of cup present and discount switches- LCB P-11 is discount switch, P-13 is cup present switch
	Free vend option set to YES	Check MODE 13, set free vend option to NO
	Free count option set incorrectly	Check MODE 13, set free count option correctly
	Selection price set to .00	Set price correctly-MODE 4
Pressing mode switch, does not enter service mode	Check for correct wiring of mode switch at LCB	Check LCB P-16 is mode switch
Pressing mode switch, cup spiral motor runs	Check for correct wiring of mode switch and cup present switch	Check LCB P-16 is mode switch P-13 is cup present switch
Turning on discount switch enters a service mode	Check for correct wiring of discount switch and mode switch	Check LCB P-16 is mode switch, P-11 is discount switch

## DIRECTIONS FOR REPLACEMENT OF LOGIC CONTROL BOARD

**DO NOT REMOVE THE BOARD OR THE EPROM WITHOUT CARRYING OUT THIS PROCEDURE!  
NOTE DOWN ALL AUDIT DATA AND MACHINE SETTINGS IF POSSIBLE. THE FACTORY  
STANDARD SETTINGS AND PRICES WILL BE LOADED AS A RESULT OF THIS PROCEDURE.**

1. Open machine door.
2. Depress the mode switch until the display indicates **'MODE 01'**.
3. Record all accountability information required by pressing the **start** switch and stepping through **MODE 1**.
4. Access **MODE 4** and record all price setting information.
5. Insert security key into the service key switch, turn the switch to the "on" position and then back to the "off" position.
6. Depress the mode switch until the display indicates **'MODE 12'**.
7. Depress the **start** switch. The display will indicate **'CH 00'**
8. Select all channels that have been changed from the factory standards and record the **START**, **DURATION** and **MODIFIER** times. To select a channel use the **next digit** switch and **Increment digit** switches to select the desired channel and press **ENTER/START** to read the times from the scrolling display. Use chart in Appendix I to record information.
9. Depress the mode switch until the display indicates **'MODE 13'**. Press **ENTER/START** and progress through the mode and record any changes from the factory standards.
10. Remove power from the machine and replace board and/or software EPROM noting the correct arrangement of all connectors or the orientation of the EPROM.
11. Restore power to the machine. Insert security key into the service key switch, turn the switch to the "on" position and then back to the "off" position. This allows the key to be removed and prevent it being left in the machine in error.
12. The display should indicate **'MODE 11'**.
13. Depress the **start** switch. The display will indicate **'CONFIG H/B/C'**. The 'H' should be flashing to indicate that the machine is set up as a 203 hot drink machine
14. If the 'H' is not flashing press the **change digit** switch until it is. Then depress the **START** switch. The machine will then jump automatically to mode 16 to load the default values appropriate for the 203 machine. Go to step 16.
15. If the 'H' (203) was flashing correctly depress the mode switch until the display indicates **'MODE 16'**.
16. Depress the **START** switch and the display will indicate **'MODE 16'** again. Using the **Increment digit** and **next digit** switches change the '16' to '27' and then depress the **START** switch. The display will go blank.
17. When initialization and loading of the default values is complete the display will scroll the user message again.
18. Return to mode 11, recheck configuration and set the machine options.
19. Access **MODE 4** and set all selection prices.
20. Access **MODE 12** and reset all channel times recorded in step 8 above. Proceed to **MODE 13** and reset all payment options.

## MOTOR CONTROL BOARD PIN CONNECTIONS

### **P1 LOGIC POWER SUPPLY**

P1-1 110Vac to transformer primary  
 P1-2 110Vac return  
 P1-3 24Vac to motor control board  
 P1-4 Key  
 P1-5 24Vac return

### **P2 110Vac CONSTANT AND SWITCHED SUPPLY VOLTAGE**

P2-0 Key (future)  
 P2-1 110Vac to inlet water valves  
 P2-2 Key  
 P2-3 110Vac neutral  
 P2-4 110Vac constant supply  
 P2-5 110Vac switched by bucket switches-disables all relay outputs-SWITCH #27  
 P2-6 Key (future)

### **P3 CUP DROP AND SPIRAL CONTROL**

P3-1 Cup drop start pulse 110Vac controlled by channel 3  
 P3-2 Cup spiral advance 110Vac-disables machine 'Out of Order' 90 seconds after cup switch is on continuously  
 P3-4 Key  
 P3-5 110Vac neutral - If no wire is present, neutral is provided through P2-3

### **P4 BREWER AND SWING OUT BRACKET**

P4-1 Brewer motor 110Vac-controlled by channel 8  
 P4-2 Key  
 P4-3 Brew water valve 110Vac-controlled by channel 9  
 P4-4 Neutral 110Vac brewer and brew water valve  
 P4-5 Regular coffee auger 110Vac (through swing out interlock) controlled by channel 6  
 P4-6 Decaf auger motor 110Vac (through swing out interlock) controlled by channel 7

### **P5 COMMODITY VALVES-ALL 110Vac**

P5-2 Commodity trough valve-controlled by channel 13,18,19  
 P5-3 Brewed tea valve-controlled by channel 26  
 P5-4 Chocolate valve-controlled by channel 33  
 P5-5 Soup valve-controlled by channel 35  
 P5-6 Key  
 P5-7 Neutral

### **P6 CANNISTER RACK-ALL110Vac MOTORS**

	CONTROLLED BY CHANNEL #
P6-6 Sugar substitute	16,25,33,68
P6-7 FD gourmet	22
P6-8 FD coffee	20
P6-9 FD decaf	21
P6-10 Soup	36
P6-11 Tea FD or FB	27
P6-12 Lightener	14,23,30,66
P6-13 Sugar	15,24,31,67
P6-14 Key	
P6-15 Neutral	
P6-16 Chocolate auger	34
P6-17 Chocolate whipper	33
P6-18 Soup whipper	35
P6-19 Tea brewer motor	29
P6-22 Coffee whipper motor	56,57,71

### **P7 MOTOR CONTROL TO LOGIC CONTROL INTERFACE**

P7-1 24Vac hot  
 P7-2 24Vac return  
 P7-3 24Vdc hot  
 P7-4 dc ground  
 P7-5 -6.5Vdc measured to dc ground  
 P7-6 ac present -6.5Vdc measure to dc ground P7-5 -6.5Vdc will drop when to 0Vdc-when overflow bucket circuit is open  
 P7-7 through 11 Data transfer lines

### **P8 WATER HEATER CIRCUIT LOGIC LEVEL THERMOSTATS**

P8-1 110Vac Top heater  
 P8-2 Neutral  
 P8-3 110Vac Bottom heater

### **P8 WATER HEATER CIRCUIT DIRECT CONTROL THERMOSTATS**

P8-1 Not used  
 P8-2 Neutral  
 P8-3 110Vac constant for both heaters

### **P10 GRINDER POWER**

P10-1 Large grinder 110Vac-controlled by channel 4  
 P10-2 Neutral for large grinder and swing out bracket

### **P11 110Vac IN TO MOTOR CONTROL BOARD FOR GRINDER AND HEATERS**

P11-1 110Vac hot  
 P11-2 110Vac neutral

## LOGIC CONTROL BOARD PIN CONNECTIONS

### **P1 INTERCONNECT TO MOTOR CONTROL BOARD**

P1-1 24Vac hot  
P1-2 24Vac ground  
P1-3 24Vdc hot  
P1-4 dc ground  
P1-5 -6.5Vdc measured to dc ground  
P1-6 ac present -6.5Vdc measure to dc ground P7-5  
-6.5Vdc will drop when to 0Vdc-when  
overflow bucket circuit is open  
P1-7 through 11 Data transfer lines

### **P6 COIN MECHANISM**

P6-1 24Vdc return to pin 10 coin mech  
P6-2 Key  
P6-3 24Vdc hot to pin 12 coin mech  
P6-4 Key  
P6-5 Data line to pin 5 coin mech  
P6-6 Interrupt line to pin 4 coin mech  
P6-7 Accept Enable to pin 6 coin mech  
P6-8 Reset to pin 11 coin mech  
P6-9 Send line to pin 3 coin mech  
P6-10 5Vdc hot to pin 1 coin mech  
P6-11 dc ground to pin 2 coin mech  
P6-12 .05 dispense line to pin 9 coin mech  
P6-13 .10 dispense line to pin 8 coin mech  
P6-14 .25 dispense line to pin 7 coin mech

### **P15 BILL VALIDATOR**

P15-1 Escrow high  
P15-2 \$1 high  
P15-3 \$2 high  
P15-4 \$5 high  
P15-5 Escrow low  
P15-6 \$1 enable  
P15-7 \$2 enable  
P15-8 \$5 enable  
P15-9 Bill validator credit pulses  
P15-10 Key  
P15-11 Dc ground  
P15-12 24Vac hot  
P15-13 24Vac return  
P15-14 +15Vdc  
P15-15 +6.5Vdc

**NOTE: THE FOLLOWING CONNECTORS ARE SENSORS ONLY AND ALL TESTING SHOULD BE DONE WITH POWER OFF AND CONNECTOR REMOVED FROM THE CIRCUIT BOARD. THE ONLY TEST THAT SHOULD BE DONE IS A CONTINUITY TEST TO CHECK THE SWITCH FOR CORRECT OPERATION.**

### **P7 ELECTRONIC LIQUID LEVEL CONTROL VERSION 2 ONLY - SWITCH #40**

P7-1 To tank lid ground  
P7-3 Key  
P7-4 Tank probe

### **P9 BREWER CONTROL CIRCUIT**

P9-1 Brewer delay switch-SWITCH #35  
P9-2 Key  
P9-3 Common  
P9-4 Brewer cycle switch-SWITCH #34  
P9-5 Brewer water switch-SWITCH #33

### **P10 WATER TANK SENSORS**

P10-1 Common  
P10-2 Key  
P10-3 Water level switch-SWITCH #39-disables machine  
'Out of Order' after water inlet switch operates  
continuously for 90 seconds - Version 1 software

#### **LOGIC LEVEL THERMOSTATS**

P10-5 Rear thermostat-SWITCH #37  
P10-6 Front thermostat-SWITCH #36

#### **DIRECT CONTROL THERMOSTATS**

P10-5 Connected to P10-1 at tank-SWITCH #37  
P10-6 Not used-SWITCH #36

### **P11 DISCOUNT SWITCH-SWITCH #25**

P11-1 Common  
P11-2 Discount switch (N.O.)

### **P12 FLUSH INTERLOCK SWITCH-SWITCH #26**

P12-1 Common  
P12-2 Flush interlock switch (N.O.)

### **P13 CUP PRESENT SWITCH-SWITCH #28**

P13-1 Common  
P13-2 Cup present switch (N.C.)

### **P16 MODE SWITCH-SWITCH #30**

P16-1 Common  
P16-2 Mode switch (N.O.)

### **P17 CYCLE LED**

P17-1 Common  
P17-2 LED

## LED PRINTED CIRCUIT BOARD PIN CONNECTIONS

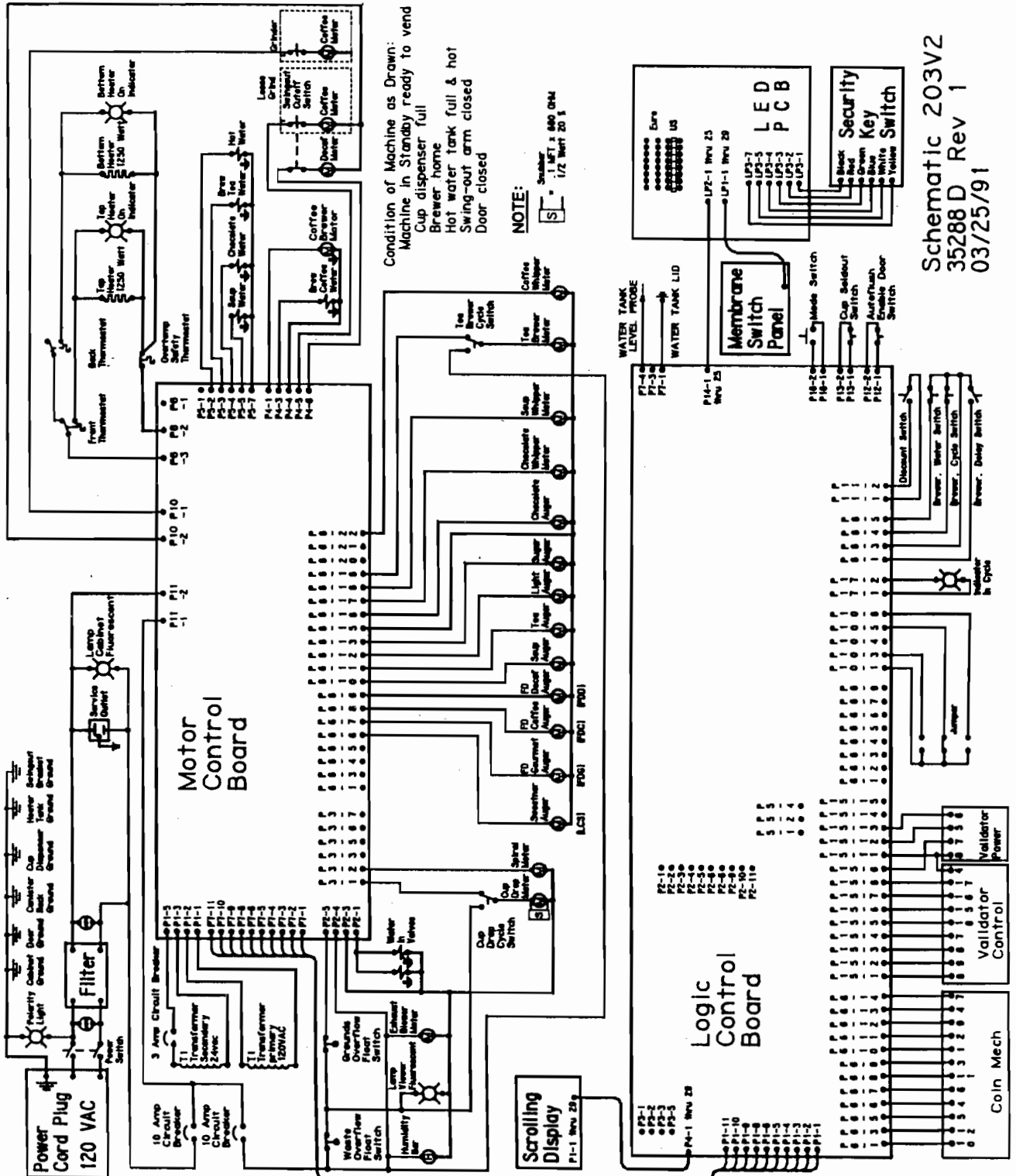
LP1-1 THRU 29 MEMBRANE SELECTION SWITCH  
See pg 2.12 for pin connections

LP2-1 THRU 25 INTERCONNECT TO LOGIC CONTROL

LP3-1 THRU 7 SECURITY KEY SWITCH #29



# SCHEMATIC - VERSION 2 SOFTWARE



Schematic 203V2  
 35288 D Rev 1  
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