

THIS **SUPPLEMENT** CONTAINS  
**IMPORTANT**  
INFORMATION - PLEASE READ THOROUGHLY

 **Automatic Products**  
*international, ltd.*

**203**

**HOT DRINK MERCHANDISER  
SERVICE MANUAL  
SUPPLEMENT**

**FOR USE WITH DUAL CUP OR LARGE CAPACITY  
CUP DISPENSER MACHINE WITH  
VERSION 00B SOFTWARE WITH  LABEL**

**300 JACKSONVILLE ROAD WARMINSTER, PA 18974**



# SUPPLEMENT TO SERVICE MANUAL AP 203 HOT BEVERAGE MERCHANDISER WITH DUAL CUP DISPENSER

## INTRODUCTION

This supplement contains information regarding the changes to the AP203 HBM that permit the dispensing of two different cup sizes and/or two different drink volumes. The changes to the machine involve a number of software revisions plus numerous physical changes including harnesses to the machine. These changes make the dual cup option not retrofittable to machines presently in the field.

This supplement is divided into three basic sections:

- 1) Changes to the software that operates the machine and the information contained on the label of the program EPROM.
- 2) Changes to the operation of certain service modes.
- 3) Physical changes to the machine including pin assignments on the control boards.

Each section will contain information regarding the changes as they apply to specific items, however since all the changes are related, we recommend that this supplement be read thoroughly and used in conjunction with the AP203 Service Manual. Any information included in this Supplement will supersede or replace information contained in the standard Service Manual or the pink Service Manual Supplement that was previously supplied with all Dual Cup machines.

## SOFTWARE AND LABEL CHANGES

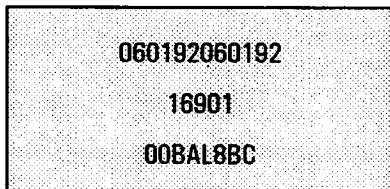
This software revision for machines with dual cup option will be known as "Version 00B" and can be identified by a blue label on the EPROM on the logic board. All revisions of the dual cup software will be identified with a LETTER in the third position as compared to 'standard' software (non dual cup) which will always have a NUMBER in the third position - see example below. The other digits on the chip label also have specific meanings which are explained in the chart on the next page.

### EXAMPLE - SOFTWARE LABEL

DATE CODE =>

ORDER # =>

CHIP # =>



The basic premise of the new software is that by redefining Mode 11, OPTION 3 and providing three additional options in Mode 11, and redefining the VOLUME option in Mode 13, the machine is now capable of delivering either two different cup sizes and/or two different fill levels of all drinks and the addition of a number of new channels to create a new selection - CUSTOM SELECT COFFEE. The percentage set in the VOLUME setting in Mode 13 determines the fill level for the regular drink and the option settings and the duration of assigned channels in Mode 12 determines what drink is delivered as the CUSTOM SELECT COFFEE. The HBM is preset to deliver a Cafe Mocha /cappuccino when the CUSTOM SELECT COFFEE is enabled.

## SERVICE MODE CHANGES

The service modes listed in the following pages have some changes included in them. For the sake of clarity, the changes to the service mode will be marked in **BOLD ITALICS**. *Mode 1, which contains the accountability information (MIS), is available in two different configurations.* The first type of accountability is the type that has been available in previous software versions - ten customer settable price lines. These ten price lines are set in Mode 13, and are represented in Mode 1. *The second, and newest type of MIS information available, will be referred to as "PRODUCT INFORMATION". Using the sequence MA, MB, MC, etc. this will represent the number of products sold for each selection by size. These two types of MIS are not interchangeable, and only one type is available in a single machine.* The two flowcharts on the pages following Mode 1 explain the sequence and meaning of both types of MIS. *The MIS information is a factory set option and is not changeable in the field except by changing the entire logic board!* Modes 4 & 5 control the price setting for large and regular sizes; respectively. Mode 11 has the definition of Option #3 changed and has had Options 5,6 & 7 added to allow customer control of the priority and configuration of the dual cup cabinet. Mode 12 has had different channels added to some of the selections to allow for more flexibility in programming special drink requests. Mode 13 has had the 'VOLUME' option redefined to allow for the regular drink fill level. All service mode function that use the START button will use the RIGHT or large size start button.

- ◆ All adjustments to ingredients are made for the large drink, the small drink will have these adjustments made automatically by the VOLUME setting.

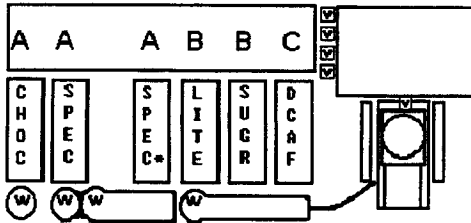


**SCROLLING DISPLAY**

One of the changes that is immediately apparent is that the scrolling display will show the price for both the regular and the large drink at the same time. The price for the regular drink will appear on the left half of the display while the right side displays the vend price for the large size. A new message may appear, "USE OTHER CUP SIZE", depending upon the setting of the options in MODE 11. This message will appear only if a drink size is disabled when that cup is not available. See MODE 11 for further information on the options that control the appearance of this message. The display will also show the message "CLEANING" during an automatic flush cycle.

**SPECIAL CANISTER RACK CONFIGURATION**

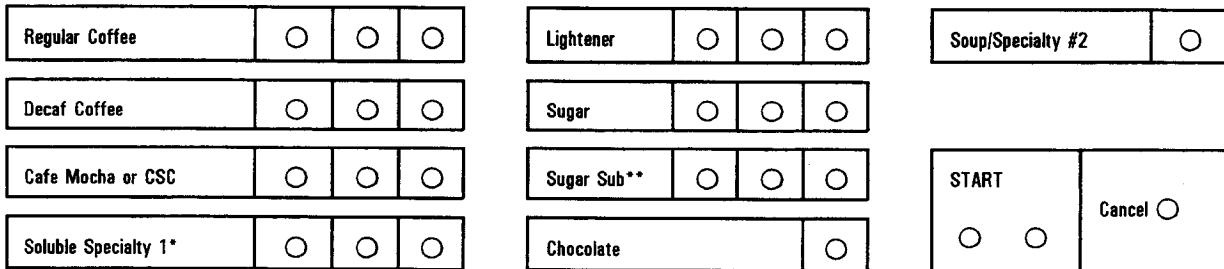
A modified version of software has been developed that will allow the dispensing of two soluble gourmet products plus Custom Select Coffee which is factory set to deliver Cafe Mocha. This change is accomplished by both a software revision in which the first digit of the chip # changes to a "B", and a change to the arrangement of the canisters and troughs on the rack as indicated in the drawing.



- A - 180rpm motor
- B - 90rpm motor
- C - 51rpm motor
- V - Valve
- W - Whipper

Referring to the drawing, you will notice that the lightener, sugar and decaf have been moved to the right end of the rack in their own separate trough. This movement creates enough space to install an additional small trough for the soup and the new specialty selection. The new specialty selection is using the FB Tea product and water channels and the whipper uses a piggyback connection at the water valve to energize the whipper at the same time the valve is on, similar to the 8050. Because the right hand trough only has space for three canisters, in LG or G configuration, a choice must be made between sugar sub or decaf, as only one is available. However, if there are two selections on the swingout bracket (DG, GLG, DH), then the open space is now available for sugar substitute. The water tank will be equipped with 4 commodity valves to provide a separate adjustable channel for the specialty soluble product that replaces the tea. The software further improves upon these changes by disabling the blinking LEDs for additives (lightener, sugar, etc) when the fourth prime selection is chosen. The diagram below indicates the position of the selections on the membrane panel. In all models, MODE 11, Option # 4, must be set to "Y" to provide the separate channels required to correctly mix the new specialty product. The machine may be equipped with up to 4 whippers as indicated in the diagram.

**SPLIT TROUGH SELECTOR PANEL LAYOUT**

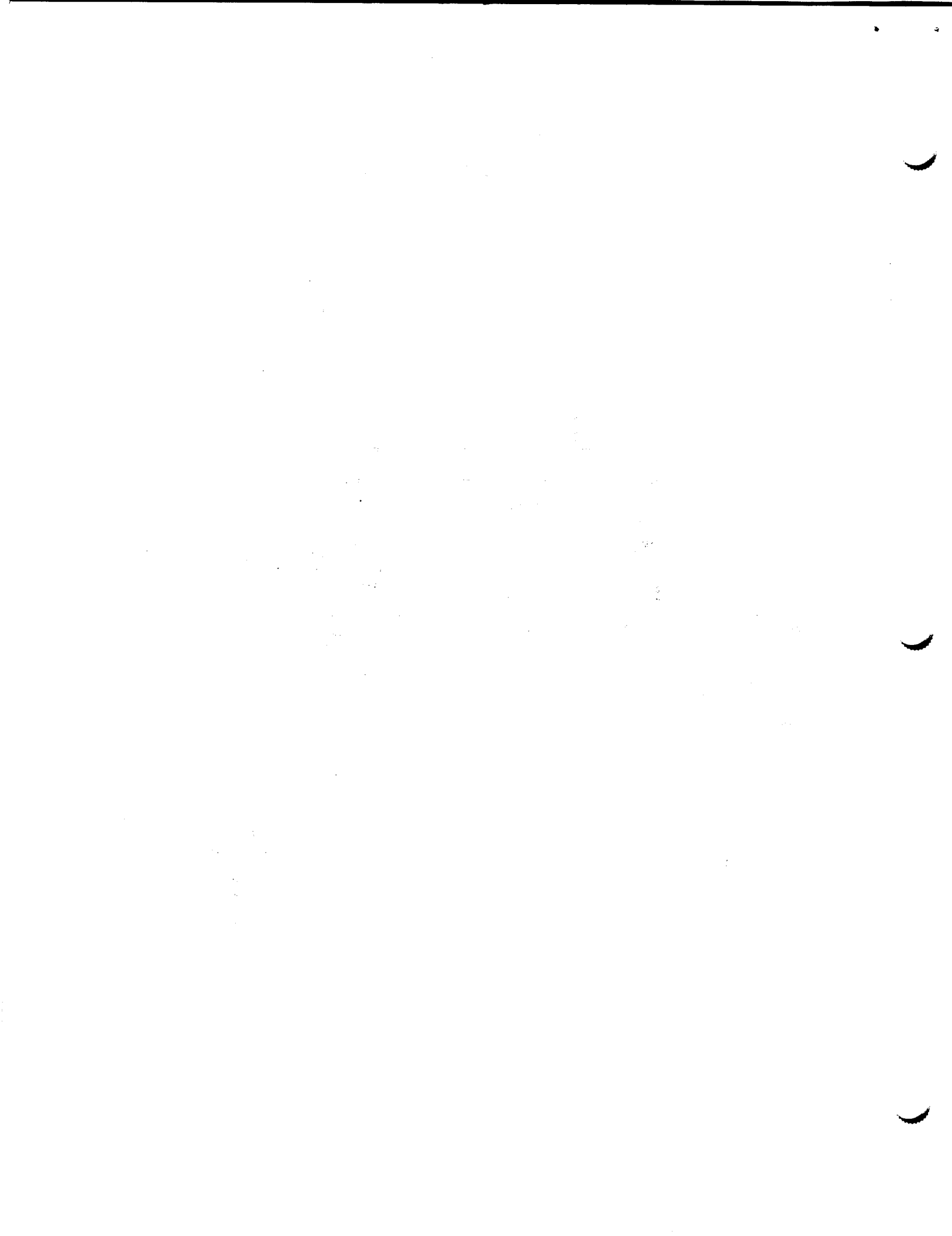


\*\* Sugar Sub available only when machine is fresh brew and has two coffees on the swing out bracket.



**DEFINITIONS OF INFORMATION  
CONTAINED ON EPROM LABEL**

<b>0</b>	RESERVED FOR SPECIAL SOFTWARE	0 - STANDARD RACK CONFIGURATION B - SPLIT TROUGH CANISTER RACK			
<b>0</b>	SETS MIS INFORMATION THAT IS RECORDED	0- 10 PRICE LINES 1- PRODUCT TOTALS			
<b>B</b>	SOFTWARE VERSION	NUMBER- STANDARD SOFTWARE LETTER- DUAL VOLUME			
<b>A</b>	POSITION #4 INDICATES FACTORY SETTING OF MODE 11, OPTION 3 & 5	LETTER - YES- <i>CUSTOM SELECT COFFEE</i> ON MEANS 3RD SELECTION IS CAFE MOCHA  NUMBER- NO - FREEZE DRIED GOURMET ON THE CANISTER RACK			
	IF POSITION 4 IS	OPTION 3 =	OPTION 5 =		
	A	YES	CSC ON	YES	2 CUP SIZES
	B	YES	CSC ON	NO	1 CUP SIZE
	0	NO	CSC OFF	YES	2 CUP SIZES
	1	NO	CSC OFF	NO	1 CUP SIZE
	1 or higher	Custom chip			
<b>L</b>	LARGE CUP SIZE	L- 12oz J- 10oz 9- 9oz 8- 8½oz 7- 7oz 6- 6oz 0- Single cup size			
<b>8</b>	SMALL CUP SIZE	L- 12oz J- 10oz 9- 9oz 8- 8½oz 7- 7oz 6- 6oz			
<b>B</b>	TEA CONFIGURATION	B- Fresh brew F- Freeze-dried Z- Tea replaced with soluble gourmet coffee - split trough only X- Disabled			
<b>C</b>	CHART ASSIGNMENT	A- G or LG B- G or LG with FD decaf C- DG or DH D- DG or DH with FD decaf E- GLG F- GLG with FD decaf H- All Freeze-dried			





## CUP CAPACITIES - DUAL CUP

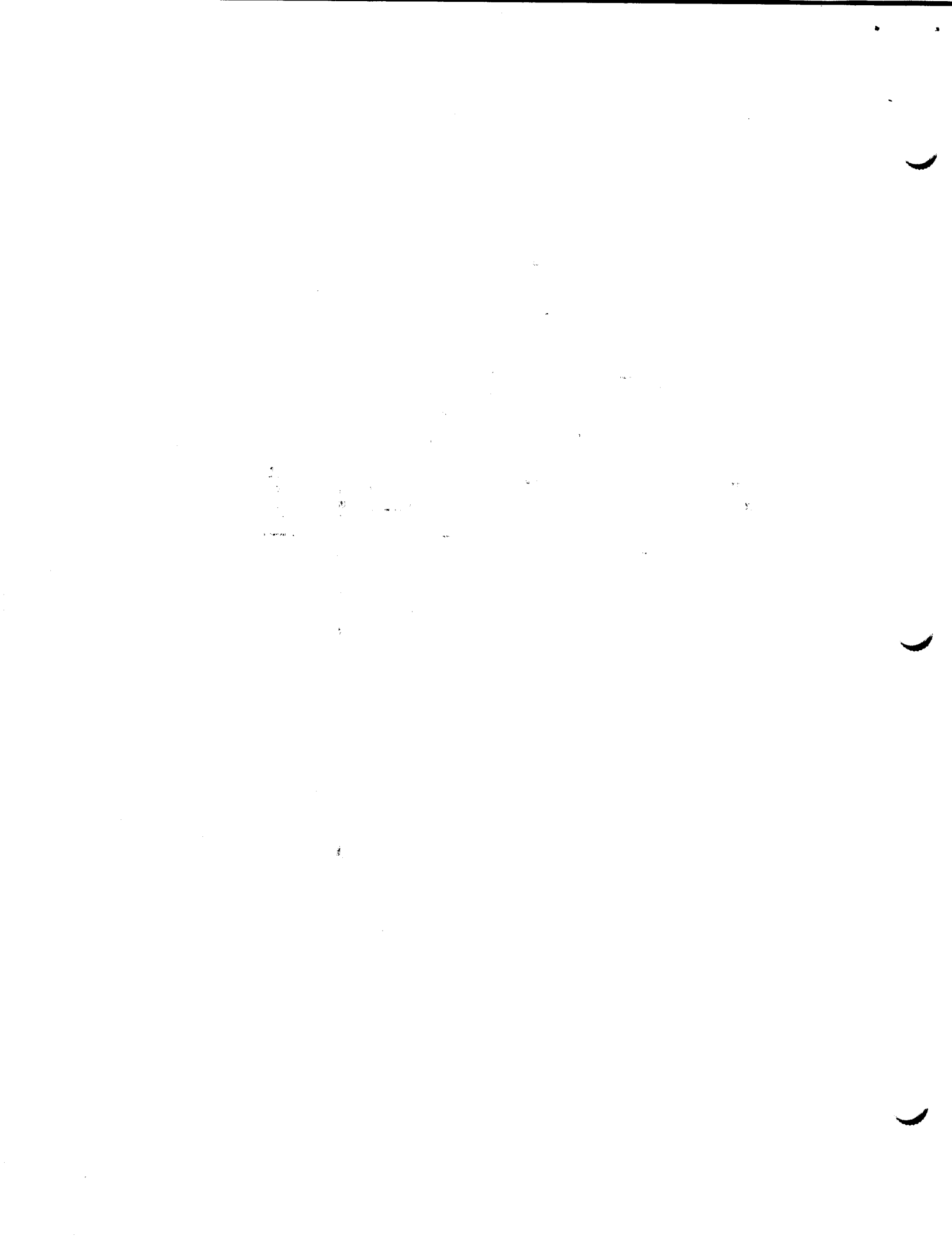
Cup size	Cup ring part #	Cam Identification	Large Cabinet	Small Cabinet	Manufacturers Cup #
7 oz.	16012	7H	656	429	Swt♥ PV577,IMP SVR-0070
8½ oz.	16012	7H	590	378	Swt♥ PV588,IMP SVR-0080 Conf Cup 210-2000AV
8 oz. insul	36252	10C/12C**	350	251	Swt♥ 8XTX
9 oz.	16013	9C	552	356	Swt♥ PV509,IMP SVR-0090
10 oz.	16013	9C	543	354	IMP SVR-10
12 oz. tall	16013	9C	533	341	IMP SVR-0120A
12 oz. squat	36211	12	552	352	IMP SVS-0120, Swt♥ PV512T Conf Cup 355-2000AV
12 oz. squat	36120	12**	549	366	Swt♥ PV512
12 oz. insul	35994	7C	321	203	Swt♥ 12XTX(12VTX)

\*\* CAMS ARE SPECIALLY MODIFIED FOR USE WITH THIS CUP RING ONLY - DO NOT INTERMIX WITH ANY OTHER CAMS!

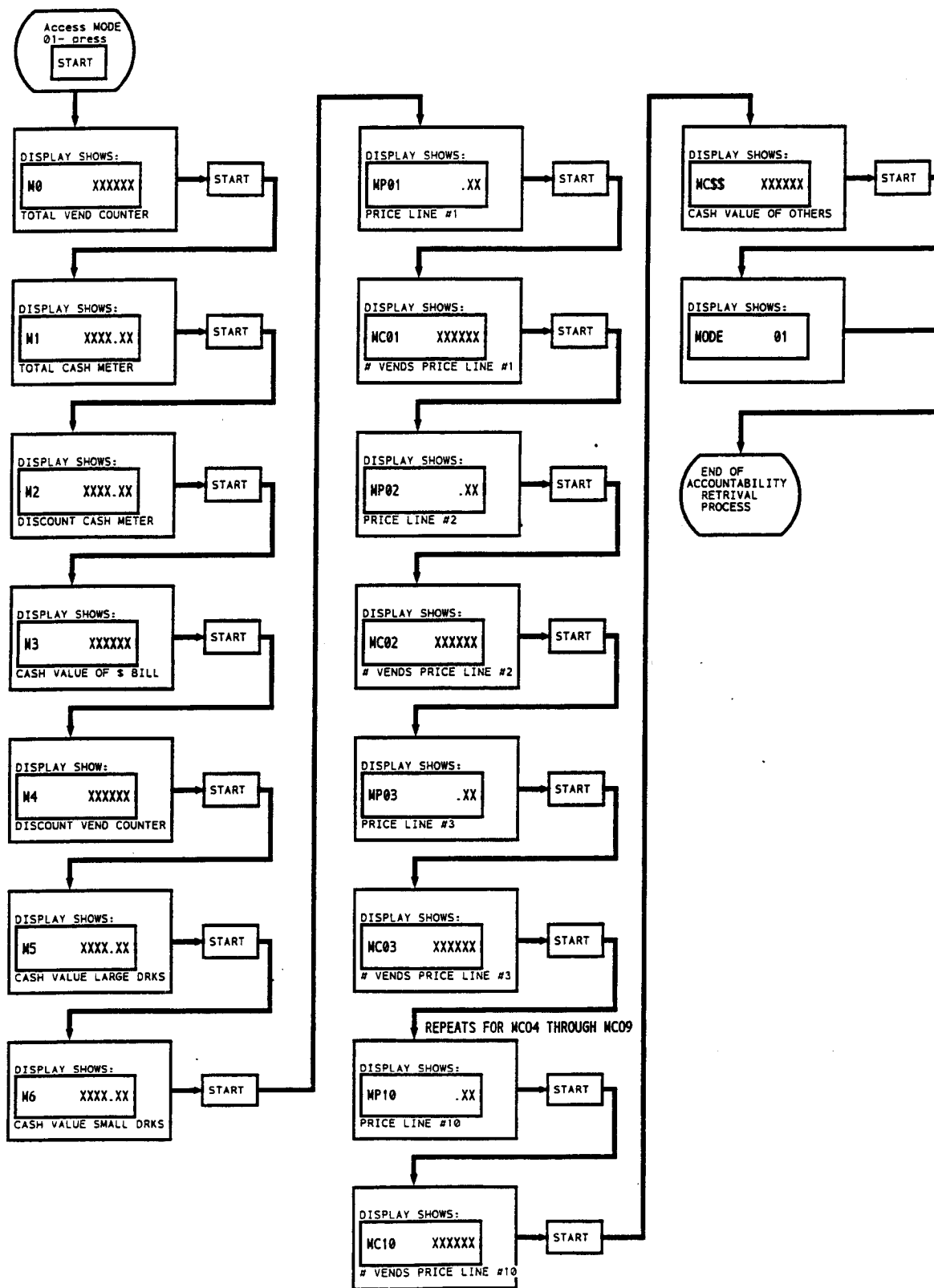
**SERVICE MODE CHANGES****MODE 1 - DISPLAY REPORT**

- Open machine door. Turn 3A (red) circuit breaker off then on.
- Depress the mode switch once so the display indicates "MODE 01".
- Depressing the large START front panel selection switch, the display will indicate "M0", followed by "- XXXX". This is the total vend count.
- 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.
- 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.
- 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.
- 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.
- Depress the START front panel selection switch again and the display will indicate "M5", followed by "- XXXX.XX". This is the total cash value of large drink vends.**
- Depress the START front panel selection switch again and the display will indicate "M6", followed by "- XXXX.XX". This is the total cash value of small drink vends.**
- Depressing the START front panel selection switch again will cause the machine to display additional breakdowns of the vend totals by one of two methods. The software contained in the machine determines which style of MIS information is displayed. The first type of accountability is the type that has been available in previous software versions - ten customer settable price lines. These ten price lines are set in Mode 13, and are represented in Mode 1. **The second, and newest type of MIS information available, will be referred to as "PRODUCT INFORMATION". Using the sequence MA, MB, MC, etc. this will represent the number of products sold for each selection by size. These two types of MIS are not interchangeable, and only one type is available in a single machine.** The two flowcharts on the pages following Mode 1 explain the sequence and meaning of both types of MIS. **The MIS information is a factory set option and is not changeable in the field except by changing the entire logic board!**
  - ◆ 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.**
- 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.

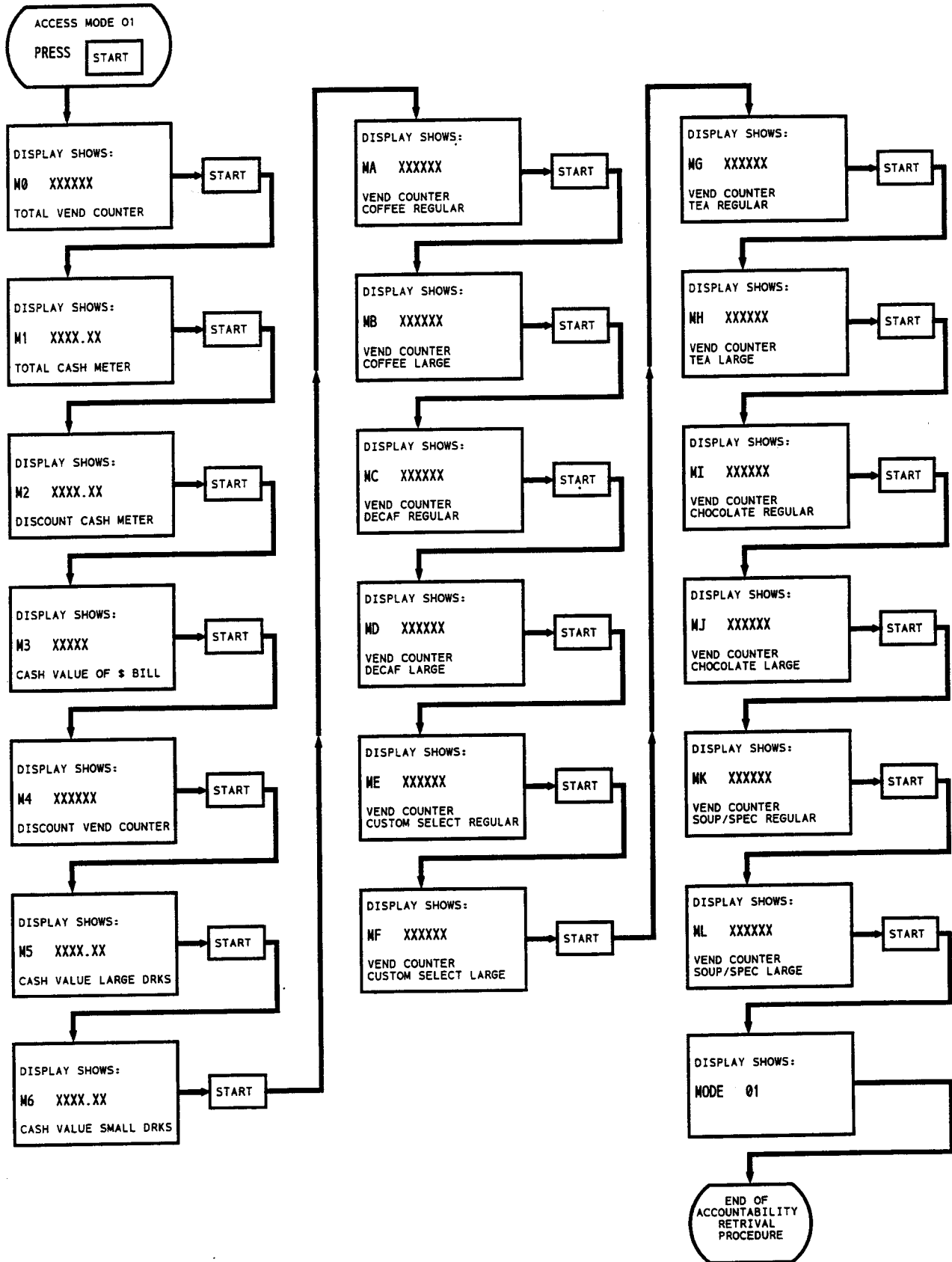


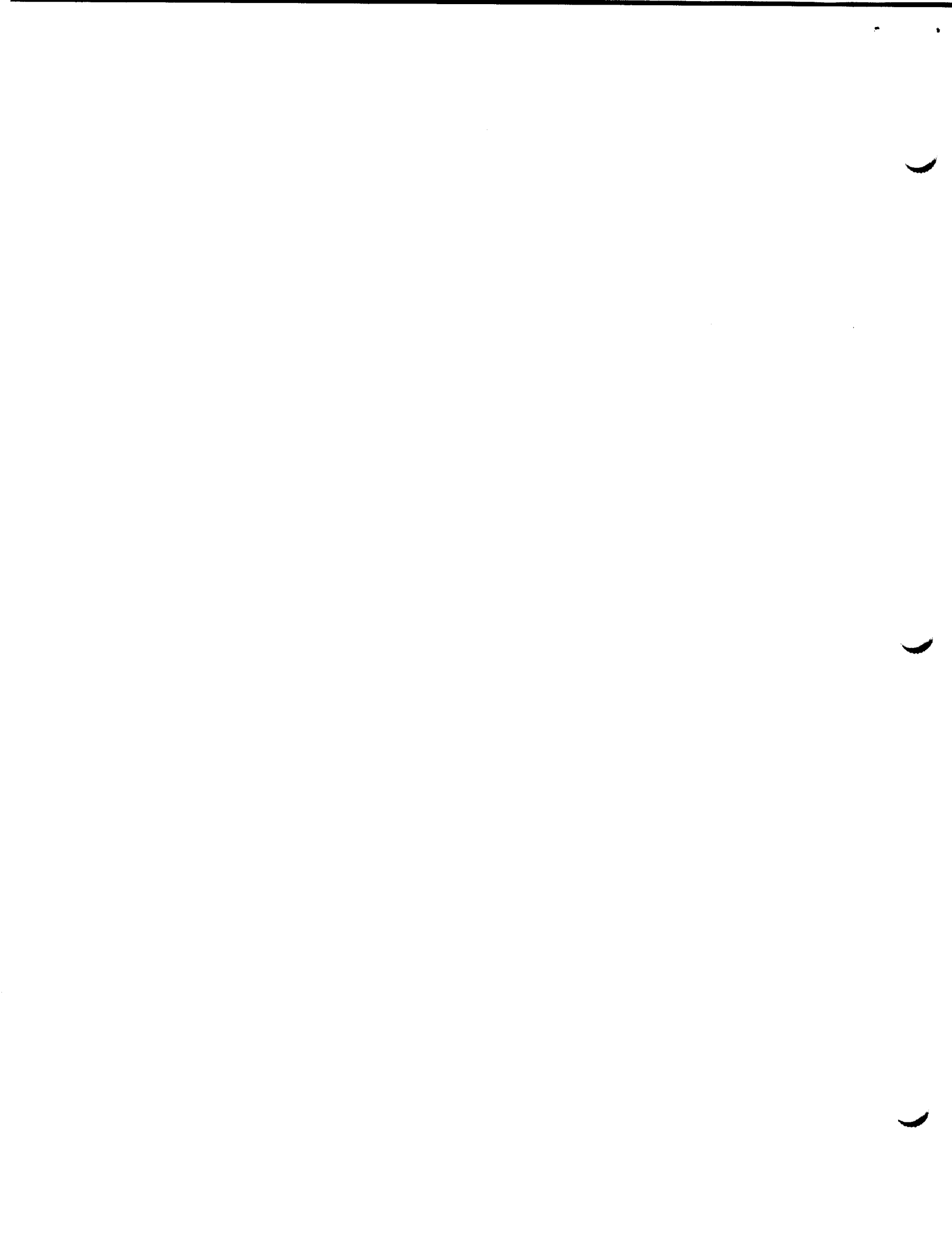
# ACCOUNTABILITY INFORMATION FLOWCHART USING 10 SETTABLE PRICE LINES





### ACCOUNTABILITY INFORMATION FLOWCHART USING PRODUCT INFORMATION





## MODE 4-SET LARGE SIZE DRINK PRICE

*Mode 4 now sets the selling price for LARGE size drinks only. Both Mode 4 and 5 must be set for the large and regular drinks to vend correctly.*

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".

## MODE 5-SET REGULAR SIZE DRINK PRICE

*Mode 5 now sets the selling price for REGULAR size drinks only. Both Mode 4 and 5 must be set for the large and regular drinks to vend correctly.*

1. Open machine door.
2. Depress the mode switch until the display indicates "MODE 05".
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 05".

◆ EACH PRIME SELECTION MAY HAVE TWO PRICES ASSIGNED TO IT. THE MILD AND REGULAR STRENGTH ARE ASSIGNED THE SAME PRICE AND THE STRONG SELECTION MAY BE ASSIGNED A SEPARATE PRICE.

◆ SETTING PRICES TO 0.00 WILL SET A SELECTION TO FREE VEND.

◆ SETTING BOTH PRICES FOR A SELECTION (REGULAR AND LARGE) 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 6 LOGIC LEVEL SWITCH DIAGNOSTICS

Due to the reassignment of some of the pin functions on the logic board because of the addition of the second cup cabinet, some of the switches have had their definition changed and some additional switches now appear.

### MODE 6 SWITCH LISTING - NORMAL OPERATION

SWITCH #	INDICATION	WILL APPEAR IN NORMAL OPERATION
23	RIGHT START SWITCH	N
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	CUP SENSOR INPUT	Y/N
31	LEFT START SWITCH	N
33	brewer water switch	Y
34	brewer cycle switch	Y
35	brewer delay switch	N
36	not used	N
37	logic jumper - heater voltage	Y
40	heater tank level probe (ELLC)	N
46	REGULAR CUP PRESENT SWITCH	Y
47	LARGE CUP PRESENT SWITCH	Y





## MODE 11 - MACHINE CONFIGURATION

**THE PRIMARY CHANGE TO MODE 11 INVOLVES THE FUNCTIONS CONTROLLED BY OPTION #3 AND THE ADDITION OF OPTIONS 5,6 & 7 WHICH CONTROL THE FUNCTIONS OF THE DUAL CUP CABINET. THE FACTORY SETTINGS OF OPTIONS 3,5,6 & 7 CAN BE DETERMINED BY CHECKING THE LABEL OF THE EEPROM**

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 **seven** 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	<b>CUSTOM SELECT COFFEE</b>	<b>FREEZE-DRIED GOURMET</b>
OPT 4 Y/N	Fresh brewed tea	FD tea or no tea
OPT 5 Y/N	<b>ONE CUP SIZE - will dispense from small cabinet first</b>	<b>TWO CUP SIZES</b>
OPT 6 Y/N	<i>Will vend large cup to deliver small drink if out of small cups</i>	<i>Small drink disabled if out of small cups, will display "USE OTHER CUP SIZE"</i>
OPT 7 Y/N	<i>Will substitute small drink for large drink if out of large cups unless exact change is needed</i>	<i>No substitution if out of large cups, will display "USE OTHER CUP SIZE"</i>

\* OPTION 1 MUST BE YES TO HAVE FRESH BREWED DECAF

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.

### OPTION 3 YES

*This option allow the use of a new selection - CUSTOM SELECT COFFEE - for the third prime selection. There are a number of new channels available which allow you to create a custom drink using existing products in the machine. A few examples of this might be: cappuccino or Cafe Mocha defined as brewed coffee with whipped chocolate on top or Balanced Blend, a half regular, half decaf fresh brewed coffee. This selection - CUSTOM SELECT COFFEE allows the operator to create their own special drink.*

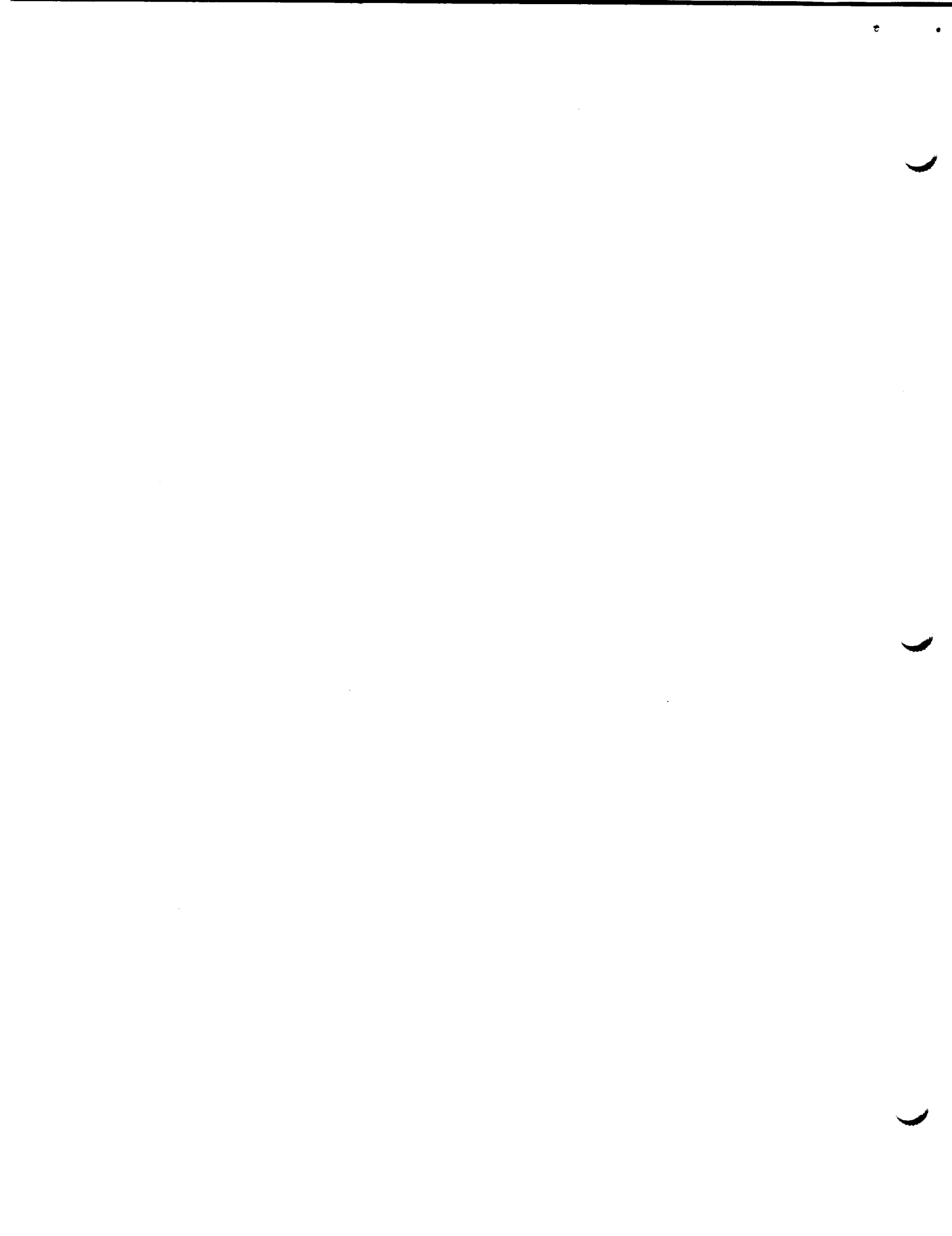
### OPTION 3 NO

*Leaving this option with the "N" flashing allows the standard gourmet selection to operate - that is a soluble drink that may have lightener and sugar added and may be whipped. This is normally set up as a freeze dried decaf using the white wire on the motor marked "FDG".*

**FOR ADDITIONAL INFORMATION ON CUSTOM SELECT COFFEE - SEE MODE 12**

### OPTION 5,6,7

*These three options control the function of the dual cup dispenser. Option 5 allows the choice between a machine containing two size cups or one which has a larger quantity of a single size cup. Options 6 & 7 allow control of the cup dispenser in the event that one size cup is not available to vend. If either or both of the options are set to "N" and that cup size is selected but not available, the scrolling display will show "USE OTHER CUP SIZE". If either or both of the options are set to "Y" and the correct change is not available, then a drink may not be delivered.*



## MODE 12 - SET INGREDIENTS

The primary changes to Mode 12 is not in the operation, testing or use of the service mode, but in the number of channels available for some selections. A number of the selections have had a channel added to allow a separate time channel for a whipper, while others have had a complete new definition of the channels available. Each selection in the machine has a number of channels organized into a RECIPE - the correct arrangement of these channels in each recipe is what creates a specific drink. For example, one of the simplest recipes is for a hot chocolate selection. The list of the channels required for a hot chocolate selection are:

Channel 02	Hot vend cycle
Channel 03	Cup drop start pulse
Channel 33	Chocolate water & whipper
Channel 34	Chocolate auger

By increasing the number of channels available for a selection, the flexibility of that selection increases. *The selection that has this maximum flexibility is named "CUSTOM SELECT COFFEE" and is the third prime selection on the left side of the selector panel.* Because each of the four prime selections are directly affected by the setting of the first four options in Mode 11, the following changes are organized by these options. *The function of the "CUSTOM SELECT COFFEE" is directly affected by whether the machine has fresh brewed coffee or freeze-dried coffee. The "CUSTOM SELECT COFFEE" is abbreviated as CSC in the channel lists.* The hot vend cycle and the cup drop are common to all drinks so they are omitted from the following lists.

MODE 11, OPTION 1 = Y - Fresh brew regular coffee  
No Change

MODE 11, OPTION 1 = N - Freeze dried regular coffee  
No Change

MODE 11, OPTION 2 = Y - Fresh brew decaf coffee  
**ADD**  
**CHANNEL 75 FB DECAF WHIPPER/TROUGH**

MODE 11, OPTION 2 = N - Freeze dried decaf coffee  
**ADD**  
**CHANNEL 74 FD DECAF WHIPPER/TROUGH**

**MODE 11, OPTION 3 = Y - CUSTOM SELECT COFFEE**  
**NEW DEFINITION**  
*The new definition of OPTION 3 = Y is the most flexible selection available in the machine. Because the function of this selection is dependent upon the presence of a brewer, the recipe for both a fresh brew and freeze dried machine are listed. The factory setting for CSC will deliver a selection that combines coffee with chocolate, identified as Cafe Mocha/cappuccino.*

### CUSTOM SELECT COFFEE - FRESH BREW

OPTION 1 = Y, OPTION 3 = Y

<u>CHANNEL</u>	<u>FUNCTION</u>
82	LARGE GRINDER/CSC
73	LG COFFEE/CSC
72	BREWED DECAF (LG/SMALL GRINDER)/CSC
10	BREW WATER/CSC
11	BREWER FILL DELAY
12	PRESSURE RELIEF DELAY
13	MAKE-UP WATER - BREWED COFFEE
14	BREWED COFFEE LIGHTENER
15	BREWED COFFEE SUGAR
16	BREWED COFFEE SUGAR SUB
17	WHIPPER-TROUGH/CSC
80	CHOCOLATE AUGER/CSC
81	CHOCOLATE WATER & WHIPPER/CSC

### CUSTOM SELECT COFFEE - FREEZE DRIED

OPTION 1 = N, OPTION 3 = Y

<u>CHANNEL</u>	<u>FUNCTION</u>
85	FREEZE-DRIED REGULAR COFFEE/CSC
84	FREEZE-DRIED DECAF COFFEE/CSC
79	FREEZE-DRIED WATER/CSC
23	FREEZE-DRIED COFFEE LIGHTENER
24	FREEZE-DRIED COFFEE SUGAR
25	FREEZE-DRIED COFFEE SUGAR SUB
71	GOURMET WHIPPER (TROUGH)
76	CHOCOLATE AUGER FD/CSC
77	CHOCOLATE WATER & WHIPPER FD/CSC

### OPTION 3 = N - FREEZE-DRIED GOURMET

<u>CHANNEL</u>	<u>FUNCTION</u>
18	FD COFFEE WATER
22	FD GOURMET AUGER
23	FREEZE-DRIED COFFEE LIGHTENER
24	FREEZE-DRIED COFFEE SUGAR
25	FREEZE-DRIED COFFEE SUGAR SUB
71	GOURMET WHIPPER (TROUGH)
76	CHOCOLATE AUGER FD/CSC
77	CHOCOLATE WATER & WHIPPER FD/CSC

MODE 11, OPTION 4 = Y - FRESH BREWED TEA  
**ADD**  
**CHANNEL 78 MAKE-UP WATER - BREWED TEA**

MODE 11, OPTION 4 = N - FREEZE-DRIED TEA  
**ADD**  
**CHANNEL 19 WATER FD TEA**  
**CHANNEL 83 TEA WHIPPER (TROUGH)**

Upon examination of the new recipes listed above, you will notice that there may be situations where you do not require all the available channels in a recipe. To disable a channel from working in a recipe, the duration for an unwanted channel should be set to zero (0.00).



◆ SPECIAL NOTE REGARDING SUGAR

If residues of sugar are found in the mixing channel after a vend is completed or if the gram throw setting or the modifier setting for sugar, especially for brewed coffee, are considerably higher than the standard settings listed on the timing chart on the previous page, then it may become necessary to replace the current 90 rpm sugar motor with one of a higher speed (180 rpm). This will allow you to dispense the desired amounts of sugar and guarantee a correct and thorough rinse of the mixing channel.

**TIMING CHANGE FOR SOUP AND FB TEA CHANNELS**

*Effective with the introduction of version B software, all soup product times will be changed to provide approximate product throws for a SOLUBLE GOURMET COFFEE (SGC). Because of the wide variation in bulk density of the different SGC products available, we highly recommend that you check, and then reset if necessary, the times for these products according to each suppliers' suggested gram throws. In addition, all split trough machines will also have the Fresh Brewed Tea product and water channels changed to reflect the use of a SGC.*

**CUSTOM SELECT COFFEE**

**CREATING YOUR OWN RECIPE**

Since the components on the Motor Control Board are shared to operate different drink selections, attempting to operate two ingredients at the same time will create a conflict. Therefore, some rules must be followed when creating the recipe for your CUSTOM SELECT COFFEE. The charts on the following pages contain times that have all these calculations considered. As long as your times do not exceed the durations or modifiers by an extreme amount, you should not have to perform any of these calculations.

1. Only one prime selection (LG regular coffee, fresh brew decaf, all FD augers, chocolate and soup) motor should be on at a time.
2. Only one prime selection (same as #1) water valve may be on at a time.
3. No trough whipper (channels 17,56,57,75,74,71) may have a START time less than 1.9 seconds, **nor should the START + DURATION time of one of these whipper channels exceed 22 seconds.**
4. A minimum of .1 second should be allowed between one device (motor or valve) turning off and the next similar device turning on. This is defined as the SEPARATION TIME.

The only exception to rule #1 is the large grinder. The large grinder can be used in combination with any other prime selection motor because it has a separate control circuit. As an example, at the right is listed a sample calculation to determine the start time for the second coffee in a half regular, half decaf for an 8 1/4 oz. selection using a dual hopper (DH) swing out bracket.

START TIME			
DECAF LG CANISTER	= 0.0		1
DURATION			
DECAF LG + 2	= HALF DECAF TIME		
2.40 seconds + 2	= 1.20 seconds		2
MODIFIER DECAF LG	= .25 (25%)		
MODIFIER x DURATION	= ADDITIONAL TIME DECAF LG CANISTER IS ON		
.25 x 1.20	= .30		3
SEPARATION TIME	= .10		4

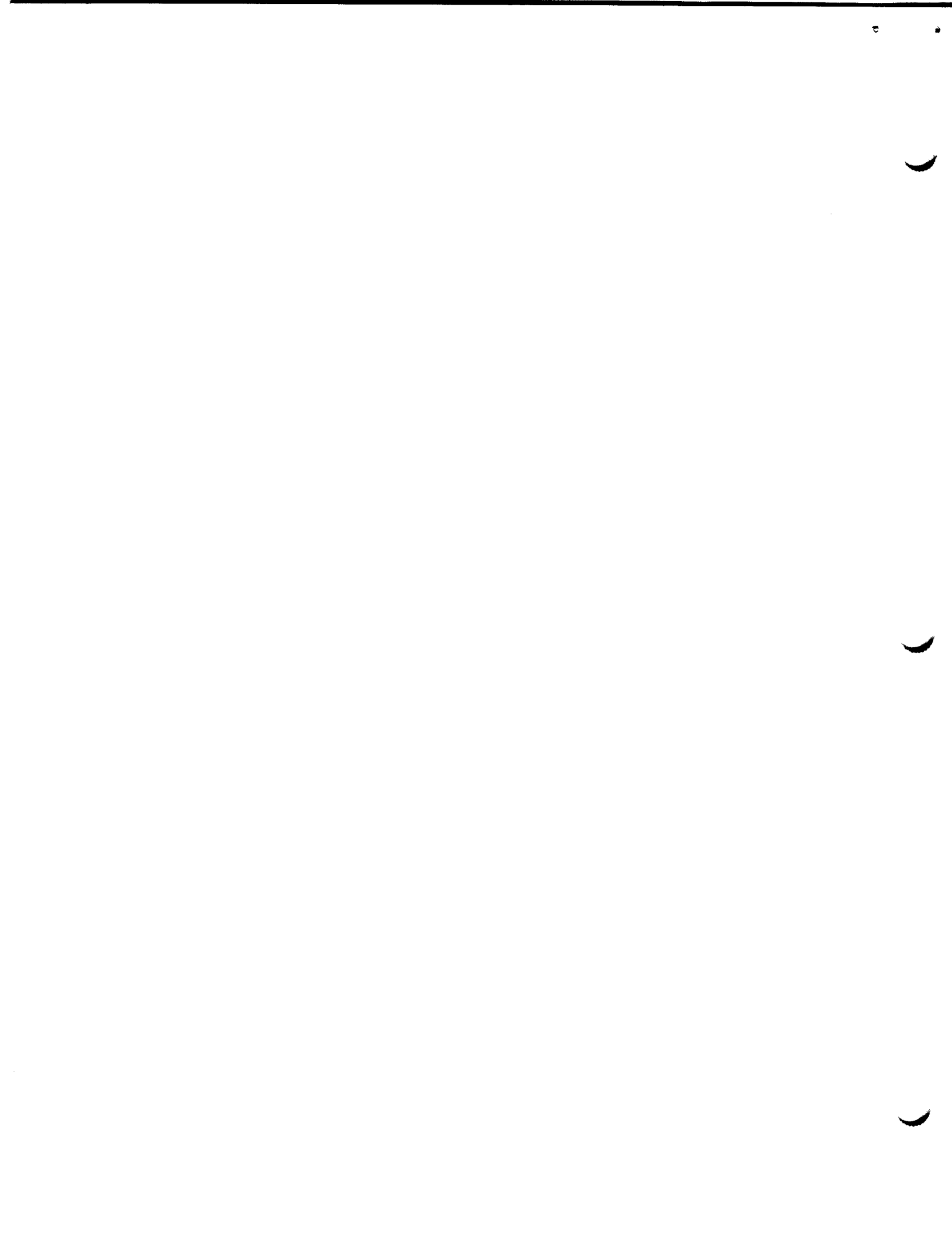
Using the above figures the minimum start time for the regular LG motor would be:

$$\begin{aligned}
 & \text{LG} \\
 \text{START} &= \text{START} + \text{DURATION} + \text{MODIFIER} + \text{SEPARATION} \\
 &= 1 + 2 + 3 + 4 \\
 1.6 &= 0.0 + 1.20 + .30 + .1
 \end{aligned}$$

The minimum start time for the regular LG motor (channel 6) would be 1.6 seconds, but please note if the duration or modifier is changed, then the START time for the LG motor should also be changed using the new times in the same formula.

**CUSTOM SELECT COFFEE**  
**SAMPLE RECIPES**

The following charts supply sample recipes for a 12 oz. Balanced Blend (half regular, half decaf) drink and a Cafe Mocha (brewed coffee and whipped chocolate) drink. The Cafe Mocha drink is set with mixture of 70% coffee and 30% chocolate.



CUSTOM SELECT COFFEE - 12 oz. CAFE MOCHA - REGULAR COFFEE WITH CHOCOLATE				
FRESH BREW - OPTION 1 = Y, OPTION 3 = Y				
CHANNEL	FUNCTION	START	DURATION	MODIFIER
82	LARGE GRINDER/CSC	0.0	1.00	.25
73	LG COFFEE/CSC	0.0	1.20	.25
72	DECAF (LG OR SMALL GRINDER)/CSC	0.0	0.00	.25
10	BREW WATER/CSC	5.1	4.30	
11	BREWER FILL DELAY	7.4	3.30	
12	PRESSURE RELIEF DELAY	19.0	2.00	
13	MAKE-UP WATER	13.0	0.00	
14	BREWED COFFEE LIGHTENER	13.0	0.95	.30
15	BREWED COFFEE SUGAR	12.0	2.40	.15
16	BREWED COFFEE SUGAR SUB	12.0	0.70	.25
17	WHIPPER-TROUGH/CSC	8.6	10.00	
81	CHOCOLATE WATER & WHIPPER/CSC	15.0	3.50	
80	CHOCOLATE AUGER/CSC	16.0	2.20	

CUSTOM SELECT COFFEE BALANCED BLEND - 12 oz. HALF REGULAR, HALF DECAF				
FRESH BREW - OPTION 1 = Y, OPTION 3 = Y				
CHANNEL	FUNCTION	START	DURATION	MODIFIER
82	LARGE GRINDER/CSC	0.0	0.55	.25
73	LG COFFEE/CSC	1.5	1.00	.25
72	DECAF (LG OR SMALL GRINDER)/CSC	0.0	1.10	.25
10	BREW WATER/CSC	5.1	5.00	
11	BREWER FILL DELAY	7.4	3.30	
12	PRESSURE RELIEF DELAY	19.0	2.00	
13	MAKE-UP WATER	13.0	0.00	
14	BREWED COFFEE LIGHTENER	13.0	1.75	.30
15	BREWED COFFEE SUGAR	12.0	3.90	.15
16	BREWED COFFEE SUGAR SUB	12.0	0.90	.25
17	WHIPPER-TROUGH/CSC	8.6	0.00	
81	CHOCOLATE WATER & WHIPPER/CSC	15.0	0.00	
80	CHOCOLATE AUGER/CSC	16.0	0.00	





**VERSION 00A - CHANNEL NUMBERS & STANDARD TIMES**

NOTE: Times shown below are for standard 12 oz. vend

CHANNEL #	DESCRIPTION	START	DURATION	MODIFIER	CUSTOMER SETTINGS		
					S	D	M
02	Vend time	0.0	30.00				
03	Cup drop - <i>RIGHT START BUTTON</i>	0.0	1.40				
04	Large grinder - reg.	0.0	1.35	0.25			
06	Loose Ground - reg coffee	0.0	1.80	0.25			
07	LG/small grinder - decaf	0.0	2.00	0.25			
08	Brew motor - coffee	4.0	25.00				
09	Water - coffee brew	5.1	5.00				
10†	<i>WATER - CUSTOM SELECT COFFEE BREWED</i>	5.1	4.30				
11	Open cylinder delay - coffee brewer	10.4	3.30	0.00			
12	Pressure relief delay - coffee brew	19.0	2.00				
13	Make up water - coffee brew	12.0	0.00				
14	Whitener auger - coffee brew	13.0	1.76	0.30			
15	Sugar auger - coffee brew	12.0	◆3.91	0.15			
16	Sugar substitute auger - coffee brew	12.0	0.71	0.25			
17†	<i>WHIPPER - CUSTOM SELECT COFFEE BREW</i>	8.6	10.00				
18	Water - FD coffee	0.8	10.60				
19†	<i>WATER - FD TEA</i>	0.8	10.60				
20	Regular coffee FD auger	2.8	3.72	0.25			
21	Decaf FD auger	2.8	3.72	0.25			
22	Coffee FD gourmet auger	2.8	3.72	0.15			
23	Whitener auger - coffee FD	2.8	1.60	0.30			
24	Sugar auger - coffee FD	2.8	4.40	0.15			
25	Sugar substitute auger - coffee FD	2.8	0.71	0.25			
26	Water - tea brew	0.5	11.00				
27	Tea FD auger	2.8	2.47	0.15			
28	Tea brew auger	0.5	0.44	0.15			
29	Brewer motor - tea	20.0	1.75				
30	Whitener auger - tea FD	2.8	1.00	0.30			
31	Sugar auger - tea FD	2.8	4.42	0.15			
32	Sugar substitute auger - tea FD	2.8	0.71	0.25			
33	Water/whipper - chocolate	1.0	10.80				
34	Chocolate auger	2.0	7.70				
35	Water/whipper - soup	1.0	10.80				
36	Soup auger	2.0	1.82				
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 - tea brewer	0.0	1.75	*			
64	Clean cycle - coffee brewer	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 & FD/CSC	6.0	0.00				
72†	<i>COFFEE FRESH BREW DECAF/CSC</i>	0.0	0.00	0.25			
73†	<i>COFFEE FRESH BREW REGULAR - LG/CSC</i>	1.5	1.40	0.25			
74†	<i>WHIPPER - FREEZE DRIED DECAF/CSC</i>	4.0	0.00				
75†	<i>WHIPPER - FRESH BREW DECAF/CSC</i>	8.6	0.00				
76†	<i>CHOCOLATE AUGER FREEZE DRIED/CSC</i>	13.0	2.20				
77†	<i>CHOCOLATE WATER &amp; WHIPPER FD/CSC</i>	12.0	3.50				
78†	<i>MAKE UP WATER FB TEA</i>	8.6	0.00				
79†	<i>WATER - FREEZE DRIED COFFEE/CSC</i>	2.8	7.10				
80†	<i>CHOCOLATE AUGER FRESH BREW/CSC</i>	16.0	2.20				
81†	<i>CHOCOLATE WATER &amp; WHIPPER FB/CSC</i>	15.0	3.50				
82†	<i>LARGE GRINDER/CSC</i>	0.0	1.00	0.25			
83†	<i>WHIPPER - FD TEA</i>	4.0	0.00				
84†	<i>FREEZE DRIED DECAF COFFEE/CSC</i>	7.6	0.00	0.25			
85†	<i>FREEZE DRIED REGULAR COFFEE/CSC</i>	2.8	2.45	0.25			
86†	<i>CUP START PULSE - LEFT START BUTTON</i>	0.0	1.40				

† NEW CHANNEL ASSIGNMENT

◆ SEE NOTE ABOUT SUGAR ON PAGE 7

\* Denotes cleaning cycle channel



### MODE 13 - SET OPTIONS

1. Open machine door. Insert security key into the service key switch, turn the switch to the "on" position and then back to the "off" position.
2. Depress the mode switch until the display indicates "MODE 13".
3. 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** *This setting expressed as a percentage (%) allows the setting of the regular as compared to the large drink - Example: 12oz. (large drink) X .75 (75%) = 9oz (regular drink). See chart at right for conversions.*

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

5. Depress the **START** switch. *If the display returns to MODE 13, then the machine is equipped with PRODUCT INFORMATION MIS and you may exit the*

*service mode. If the display indicates "PRICE1 .XX" then the machine contains PRICE LINE MIS, and you should continue with the setting of the ten price lines. PRICE1 .XX 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. Leave any unused prices to .00.

- ◆ 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.

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.

2) READ ACROSS & ENTER THIS % IN Mode 13 Volume %	1) FIND LARGE CUP VOLUME HERE AND READ DOWN TO SMALL CUP VOLUME			
	Large cup size (oz)			
	9	10	11.5	12
85%	7.65	8.5	9.75	10.2
83%		8.25		
80%	7.2	8.0	9.2	8.6
78%	7.0		9.0	
75%	6.75	7.5	8.6	9.0
72%			8.25	
70%	6.3	7.0	8.00	8.4
69%				8.25
65%	5.9	6.5	7.5	7.8
61%			7.0	
60%	5.4	6.0	6.9	7.2
58%				7.0
55%	5.0	5.5	6.3	6.6



## PHYSICAL CHANGES

The primary physical changes to the AP203 involve the cup dispensing and cup delivery area. The first obvious change is the addition of a second in-line cup dispenser, which is mounted, piggyback style, to the door of the main cup dispenser and the larger cup delivery chute on the cupwell. The internal differences of both cup dispensers include a smaller diameter spiral in the cup cabinet, the redesign of the cup motor and cup ring mounting plate.

The smaller diameter spirals and a new spiral positioning plate allow for easy adjustment of the spiral positions to accommodate a larger variety of cups. The bottom of the spiral positioning plate has two holes - standard position is with the screw in the hole closest to the door, the rear hole is only used with polystyrene (foam) cups. The top of the spiral positioning plate has three holes for 7 & 8 $\frac{1}{4}$ , 9, 10 & 12 ounce paper and 12 ounce insulated, front to rear respectively. See Figure 1.

The redesigned cup dispenser motor and cup ring assembly changes them from two separate components to one easily removed assembly to allow simple exchanges of cup sizes. The two cup dispense platforms are identical and interchangeable so that by exchanging the cup dispense platforms the capacities reflecting the actual usage of cups can change. The cup dispense assemblies have two identical 4 pin plugs, located under the large dispenser, which are marked to correspond to their position and the START button which operates that cup size.

- ◆ Reversing the two 4 pin connectors will switch which start button operates the two cup dispensers.

Another adjustment that may be required for cups to operate properly is the position of the cup dispense assembly. The cup dispense assembly is mounted to the base of the cup cabinet with four screws in long keyhole

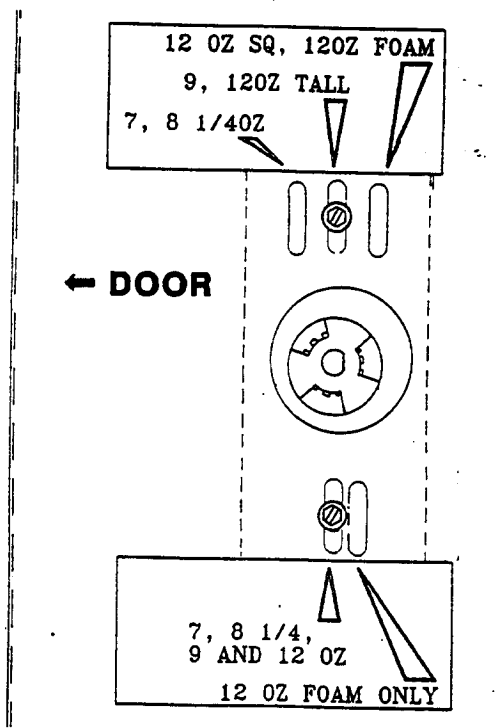
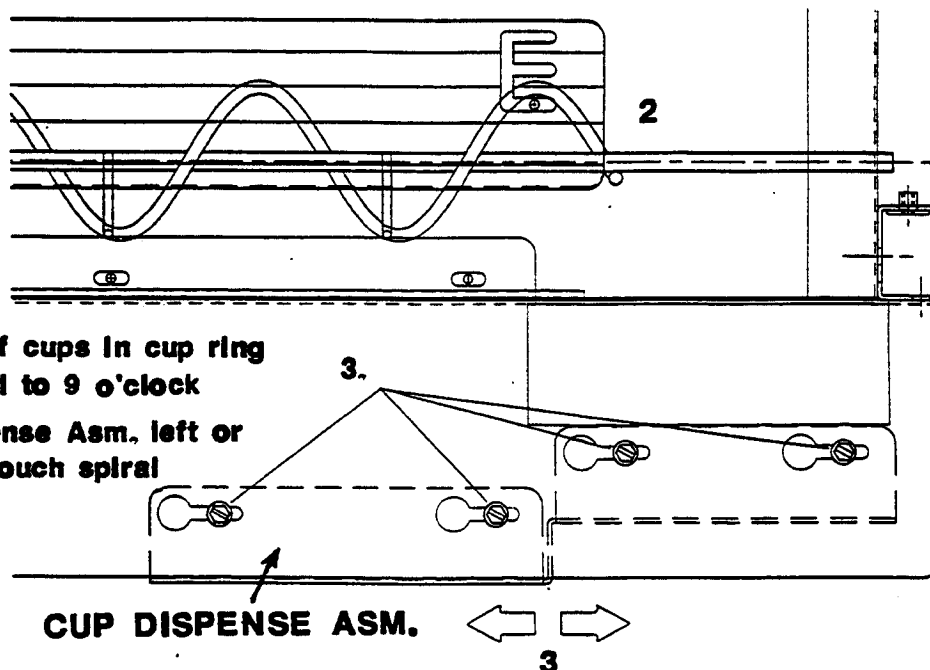


FIGURE 1

slots on the face of each cup cabinet. Place a column of your cups in the cup ring, turn the bottom spiral to point to the 9 o'clock position (see Figure 3.16 on page 3.11 of the 203 Service Manual for reference), loosen the four mounting screws and move the cup dispense assembly either left or right so that the column of cups just touches the tip of the spiral. Tighten the screws to secure the dispense assembly. This procedure and an operational check of the cup present switch should be performed anytime a cup size is changed. See Figure 2.

FIGURE 2

1. Place full stack of cups in cup ring
2. Turn bottom spiral to 9 o'clock
3. Adjust Cup Dispense Asm. left or right until cups touch spiral





**CUP SENSOR**

The cup sensor has been changed in all dual cup machines. The changes include repositioning the control board for the cup sensor to a small box mounted under the door stiffener next to the coin mechanism socket and changing the harness to allow it to connect to the logic board. Power for the cup sensor is now supplied via the harness for the viewer lamp located in the top inside left corner of the door. The original cup sensor used in all RMI machines interrupted the cup motor start pulse when a cup was placed in the cupwell. In a machine equipped with dual cups, the cup sensor board provides a closed circuit across the former cup present switch terminals (L13). This closed circuit will prevent either cup from being dispensed when a cup is placed in the cupwell. The cup sensor also provides an additional harness to allow the cup sensor to discount the normal selling price when a customer uses their own cup. To activate this discount function, the connector from the discount switch (L11) is replaced with an identical two pin connector included in the cup sensor harness and accessing MODE 13 and setting the discount percentage to 8% (DISC .08). This discount percentage will decrease all vend prices between 15¢ and 60¢ by 5¢. If this function is used, then some other kits including the discount timer cannot be used for a free vend function. The function of MODE 14 remains the same - it allows you to select which drinks the discount will apply to. If it becomes necessary to disable the cup sensor, the only step is to unplug the connector from the cup sensor control box.

**HARNESSES**

Some of the harnesses have changed due to the software and the need for additional functions. The cup present switch, formerly connected to P13 is now connected to P8 on the logic board, and there are separate cup present switches for each cup cabinet. P13 now becomes the input for the cup sensor circuit - a closure across this connector will prevent a cup from being dispensed with a vend. The piggyback cup cabinet receives its cup motor start pulse and cup spiral voltage from two pins in the canister rack connector -P6. The changes to the pinouts for both control boards are listed below.

**MOTOR CONTROL BOARD PIN CONNECTIONS****P3 CUP DROP AND SPIRAL CONTROL**

- P3-1 Cup drop start pulse 110Vac controlled by channel 3 **LARGE CUP/RIGHT START BUTTON**  
 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

**P5 COMMODITY VALVES-ALL 110Vac**

- P5-2 Commodity trough valve-controlled by channels 13,18,19,**78,79**  
 P5-3 Brewed tea valve-controlled by channel 26  
 P5-4 Chocolate valve-controlled by channels 33,**77,81**  
 P5-5 Soup valve-controlled by channel 35  
 P5-6 Key  
 P5-7 Neutral

**P6 CANISTER RACK-ALL 110Vac MOTORS**

CONTROLLED BY

CHANNEL #

- |             |   |                             |
|-------------|---|-----------------------------|
| <b>P6-3</b> | <b>Cup drop start pulse/small cabinet</b> | <b>86</b>                   |
| <b>P6-4</b> | <b>Cup spiral advance/small cabinet</b>   |                             |
| P6-6        | Sugar substitute                          | 16,25,33,68                 |
| P6-7        | FD gourmet                                | 22                          |
| P6-8        | FD coffee                                 | <b>20,85</b>                |
| P6-9        | FD decaf                                  | <b>21,84</b>                |
| 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                           | <b>34,76,80</b>             |
| P6-17       | Chocolate whipper                         | <b>33,77,81</b>             |
| P6-18       | Soup whipper                              | 35                          |
| P6-19       | Tea brewer motor                          | 29                          |
| P6-22       | Coffee whipper motor                      | <b>17,56,57,71,74,75,83</b> |

**LOGIC CONTROL BOARD PIN CONNECTIONS****P8 CUP PRESENT SWITCHES**

- P8-4** **Cup present switch - small cabinet (N.C.)**  
**SWITCH # 46**  
**P8-6** **Cup present switch - large cabinet (N.C.)**  
**SWITCH # 47**  
**P8-8** **KEY - No connection**  
**P8-9** **Common - scan line**

**P13 CUP SENSOR INPUT - SWITCH #28**

- P13-1** **Common**  
**P13-2** **Cup sensor input (N.O.)**

