SECTION 3: Vender Programming

Vender Programming

PRECAUTIONS TO TAKE WHEN WORKING WITH CONTROL BOARD

As with any printed circuit board, our electronics are very sensitive to Electrostatic Discharge (ESD). Simply walking across a tile or carpeted floor can generate a range of 30,000 to 50,000 volts of electricity. One ESD can be enough to seriously damage your control board or at least weaken it enough that erratic problems could occur in the future. Even a discharge surge under 100 to 200 volts is enough to create problems within the circuitry of the electronics. It is advised when storing the electronics that they be kept in anti-static bags, even if the electronics are thought to be defective. If a control board is thought to be defective and is really not, it soon will be after being charged with ESD. The ideal prevention against ESD is to use anti-static conductive wrist straps which ground you to the machine before touching the electronic boards. If it is not possible to use these, at least ground yourself before handling the electronic boards. Whatever method you use, always handle the electronic boards by the edges. Be careful not to touch the components on the control board.
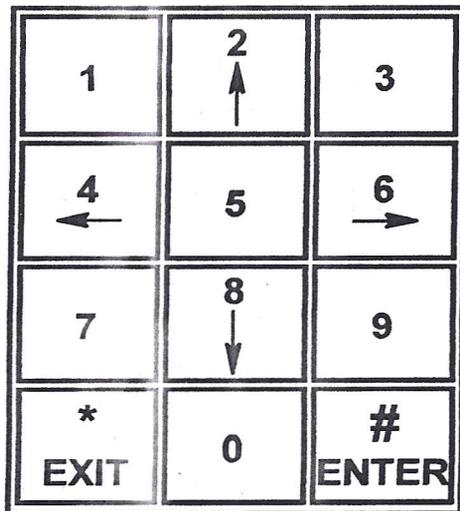
KEYPAD PROGRAMMING

It is very important that the RVV is programmed properly. All programming of the vender options is done in the Service Mode. To enter the Service Mode, open the vender door, and press and release the yellow mode button located on the control board.

The vender's keypad consists of 12 buttons. Four of these buttons (see Figure 3.1, below left) are used to program the vender and navigate through the service routines, plus two are used to move the elevator cup (in "Product Location"), as follows:

Button	Meaning	Usage
2	FORWARD	Increase, next, up
4	LEFT	Move elevator cup left
6	RIGHT	Move elevator cup right
8	BACKWARD	Decrease, previous, down
*	EXIT	Escape, cancel, exit
#	ENTER	OK, accept, save

The controller will automatically return to the Sales Mode if:

- No response from the keypad is received for approximately five minutes;
- The service mode button is pressed a second time;
- The "Return" mode is activated; or
- The door is actually closed.

If credit exists, the credit amount will be displayed after returning to the Sales Mode.

MENU SYSTEM

When programming, you must first use the programming buttons listed above to maneuver through menus and sub-menus before you will be allowed to accomplish your task. Each menu consists of various items, or modes, such as "Set Prices" Mode or the "Set Internal Clock" Mode. There are two menus:

1. INTERNAL (Service) MENU - This menu is available only with the vender's door open. It is accessed upon pressing the control board's mode button.
2. EXTERNAL MENU - This menu is available with the vender's door closed. From this menu, cash / sales counts and vender errors can be read (but not cleared).

Note: Programming flowchart located in rear of manual.

Figure 3.1
Keypad

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Free Vend Count

If <enter> is pressed at the "Free Vend Count" prompt, the controller will enter the free vend counters mode. The controller will display "View Price." If <exit> is pressed, the controller will return to the code level. From "Free Vend Count," press <up> to proceed to the next prompt, "Set Price."

- **View Price**

  If <enter> is pressed at the "View Price" prompt, the controller will enter the view price mode. The controller will display "All Selections," for a universal selection price; or "Selection," if the controller is set for multiple pricing. Selection prices can only be viewed, not changed, from this mode. If <exit> is pressed at any time during this operation, the controller will return to the "View Price" prompt. Press the <up> button to proceed to the next prompt, "Value of Free Vends."

- **Value of Free Vends**

  If <enter> is pressed at the "Value of Free Vends" prompt, the controller will enter the non-resettable free-vend cash counter display mode by displaying "All Selects $XX.XX," where the X's will represent total monetary value of free vends over the life of the vender's control board. Using <up> or <down> will cycle through each selection as "Selection #N $X.XX," where "N" represents the appropriate selection number and the X's represent the resettable free-vend cash count for that selection. If <exit> is pressed at any time during this operation, the controller will return to the "Value of Free Vends" prompt. Press the <up> button to proceed to the next prompt, "Number of Free Vends."

- **Number of Free Vends**

  If <enter> is pressed at the "Number of Free Vends" prompt, the controller will enter the non-resettable free-vend count display mode displaying "All Selects XXX," where the X's represent the number of all free vends over the life of the vender's control board. Using <up> or <down> will cycle through each selection as "Selection #N XXX," where "N" represents the appropriate selection number and the X's represent the resettable number of free vends for that selection. If <exit> is pressed anytime during this operation, the controller will return to the "Number of Free Vends" prompt. Press the <exit> button to return to the "Free Vend Count" prompt.

Set Prices

If <enter> is pressed at the "Set Price" prompt, the controller will enter the selection price setting mode. If multiple prices are enabled, the controller will display "All Selections," for a universal selection price. If <up> is pressed, the controller will display "Shelf All," which is used for pricing an entire shelf to the same price. If <up> is pressed again, the display will show "Selection," which is used to set prices for individual selections.

If <enter> is pressed while "All Selections" is displayed, the display will show "All Selections Y.YY," where "Y.YY" is the current price for all selections in the machine. Use <up> or <down> to increase or decrease the price.

If <enter> is pressed while "Selection" is displayed, the display will show "Selection XX Y.YY," where "X" is the current selection number and "Y.YY" is the selection price. Use the <up> or <down> keys to sequence through the list of available selections, or press <enter> to edit the price of the selection that is currently shown on the display. Use the <up> or <down> to increase or decrease the price.

If <enter> is pressed while "Shelf All" is displayed, the display will show "Shelf X Y.YY," where "X" is the current shelf number and "Y.YY" is the price for any of the products on that particular shelf. Use the <up> or <down> keys to sequence through the list of available shelves, or press <enter> to edit the price of the shelf that is currently shown on the display. Use the <up> or <down> to increase or decrease the price.

In all cases, when the desired price is on the display, pressing <enter> will save that price and return to the previous service mode function level. Pressing <exit> will return the controller to the "Set Price" prompt. Press <up> to proceed to the next prompt, "Product Location."

Product Location

If <enter> is pressed at the "Product Location" prompt, the display will show "Enter Password 0000," and the first "0" will be flashing. It will be necessary to enter the non-resettable password (9-8-7-6) in order to enter into the Product Location mode. To enter the password, press <up> or <down> to enter the first digit, then press <enter>. The second "0" will then begin to flash. Repeat this procedure to enter all four digits. After the fourth digit has been entered, the controller will enter the product location control mode. This mode is used to accurately set the stop locations for the vender's elevator cup, allowing precision vending. Only the positions of four selections (12, 18, 52, and 58) and the port are here adjusted; the controller will determine the positions of the rest of the selections based on the settings of the four mentioned above. Using <up>

Troubleshooting

The RVV is equipped with a self-diagnostic feature to aid in the repair and maintenance of the vender. When servicing the vender, pay close attention to the digital display. When the vender door is opened, the display will begin showing any error codes that are stored in memory. If there are no errors, the display will show "No Errors Found."

To enter the Service Mode, press and release the Service Mode Button located on the controller. The display will show "Errors Were Detected" if there are recorded errors. If <enter> is pressed at the "Errors Were Detected" prompt, the controller will enter the error display mode. The display will show the first error summary code that has occurred.

If <enter> is pressed, the controller will display the detailed error for the summary code. The <up> and <down> buttons will cycle through any remaining error detail codes. If <exit> is pressed while displaying any *detailed* code, the controller will return to the summary code. If <exit> is pressed while displaying any *summary* code, the controller will return to the code level ("No Errors Found" or "Errors Were Detected").

NOTE: When troubleshooting errors with peripherals, the appropriate peripheral service manual(s) should also be consulted for further tests and corrective actions.

Error Type	Detailed Error Code	Test Procedure	Corrective Action
Coin Changer (Coin Acceptor error)	Communication = Indicating no communication with changer for more than 2 seconds.	Check serial changer and MDB harness	Replace any harnessing found to be defective.
	Tube Sensing = Indicating a tube error.	Check changer tubes for blockage.	Clear tube blockage if found. If no blockage found replace changer.
	Inlet = Inlet chute blocked error (no coins sensed in the acceptor for over 96 hours).	Check inlet chute for blockage. Drop coins in Sales mode or Tube Fill mode to test acceptance. Manually clear the error.	Clear inlet chute blockage. If no blockage found, replace the changer. If acceptance rate is acceptable, system is probably OK. If acceptance rate is low or changer will not accept coins, replace changer.
	Low Acceptance Rate = Indicating more than 20% of the last 255 coins were rejected as slugs.	Check changer / acceptor for obstruction or dirt.	If no obstructions are apparent and the acceptance appears to be OK, this may be and indication of cheating attempts.
		Drop coins in Sale mode or Tube Fill mode to test acceptance.	If no obstruction are apparent and coins do not accept or acceptance rate is poor replace the changer / acceptor.
	Tube Jam XX = Indicating a tube jam for coin type XX.	Check changer tubes and payback for blockage.	Clear blockage, if found. If no blockage found, replace changer.
	ROM = Indicating a changer ROM checksum error.	Unplug machine and wait at least 5 seconds, replug machine. Manually clear error.	If error does not clear, replace the changer.
	Excesses = Indicating more than 255 attempts since the last coin was accepted.	Check escrow lever and associated mechanisms.	If vendor returns to Sales mode from open door mode without input, replace changer / acceptor.
		Go to open door mode and wait for 30 seconds. Manually clear the error.	If it stays in the Open Door mode and the manually cleared error does not reoccur, system may be OK.
	Coin Jam = Indicating a coin jam.	Check changer / acceptor for jammed coins or other obstructions.	If no obstructions are found, replace the coin acceptor.
	Disconnected Acceptor = Indicating an unplugged acceptor or harnessing.		
	Misrouted Coin = Indicating a coin had been improperly routed.		

SECTION 5: Troubleshooting

Error Type	Detailed Error Code	Test Procedure	Corrective Action
Bill Validator (Bill Acceptor error)	**Communication** = Indicating no bill validator communications for more than 5 seconds.	Check serial changer and MDB harnessing.	
	Full = Indicating a full bill stacker.	Ensure bill cash box is empty and that the cash box is properly closed and in place.	If cash box appears to be OK, replace the bill acceptor.
	Motor = Indicating a defective motor.	No test available.	Replace bill acceptor.
	Jam = Indicating a bill jam error.	Check bill acceptor for obstruction or dirt.	If no obstructions are apparent, replace the bill acceptor.
	ROM = Indicating a bill acceptor ROM checksum error.	Unplug machine and wait at least 5 seconds, then replug machine. Manually clear error.	If error does not clear, replace the bill acceptor.
	Open = Indicating that the stacker is open.	Check that bill cash box is closed and in correct position.	If cash box appears to be OK, replace the bill acceptor.
	Sensor = Indicating a bill sensor error.	Check bill acceptor for obstruction or dirt.	If no obstructions are apparent, replace the bill acceptor.
Card Reader (Card Reader error)	**Communication** = Indicating no card reader communication for more than 5 seconds.		
	Card Reader Error XX = Indicating that a particular type of card reader malfunction occurred, where XX indicates the error type.	No test available.	Refer to card reader manual for corrective action.
Refrigeration (Refrigeration errors)	**Temperature Sensing** = Indicating an unpluggged temperature sensor.	Check the temperature sensor connection at the control board to make sure it is plugged in. Check that it is wired properly and the pins are making contact.	If the sensor is unplugged, replug it. If it is miswired, replace the temperature sensor. If the connections are bad, attempt to repair them or replace sensor.
	Too Cold = Indicating temperatures 3 degrees below the compressor cut-out setting.	1. Check the refrigeration unit before opening the vendor's main door to see if it's running. 2. Open the main door to see if the unit cuts off. 3. Make sure the vendor's door switch is working properly. 4. Unplug one of the two white wires plugged into the refrigeration relay.	If upon unplugging the white wires the unit stops: 1. Check the temperature sensor's reading. 2. Check SetP (set point) settings. 3. Check the white wires for shorts from the control board. 4. If upon unplugging one of the white wires the unit still runs, unplug one of the black wires. If the unit stops, replace the refrigeration relay. If optional heater relay kit is not installed, one may be required. 5. If heater kit is installed and heater does not turn on (heater relay does not click upon energizing in heater relay test mode), check the two white wires from the board to the heater relay for 24VDC. Check the other wire for continuity between the control boad and the relay. If voltage is OK, replace the relay; otherwise, replace control board.
	Too Hot = Indicating temperatures 3 degrees above compressor cut-in setting.	Proceed with normal refrigeration troubleshooting. Refer to the refrigeration flow chart.	

SECTION 5: Troubleshooting

Error Type	Detailed Error Code	Test Procedure	Corrective Action
Refrigeration (Refrigeration errors)	**No Heating** = Indicating heating system not heating at 1 degree per hour or better when on.	Proceed with normal refrigeration troubleshooting. Refer to the refrigeration flow chart.	
	No Cooling = Indicating that the compressor is not cooling at 1 degree per hour or better when on.	1. Check the refrigeration unit before opening the vendor's main door to see if the unit is running. 2. Open the vendor's main door, and check the display to see that the door switch is working as normal. 3. Access the Refrigeration Mode, and check the Set Point settings. 4. While in the Refrigeration Mode, change 'dSP' to 1 to show the temperature on the display during the greeting to see if it's correct. 5. While in the Test Mode, access the Test Relays Mode, and turn compressor on.	1. If the unit is running, clear the error to see if it reoccurs. 2. If the display does not function as normal, check the door switch circuit. 3 & 4. Change any setting if necessary and check temperature sensor operation. 5. If the unit does not run (refrigeration relay not clicking upon energizing with the relay test mode), check the two white wires from the board to the refrigeration relay for voltage (should be 24VDC on one of the two wires). Check the other wire for continuity between the control board and relay. Note: The compressor relay must be on to check voltage.
Control (Controller errors)	**Door** = Indicating the door switch has been open for more than one hour.	Check the vendor's door switch to see if it's sticking or miswired. If nothing is found at the door switch, check the two wires from the door switch to the control board to see if they are pinched or shorted.	Replace the door switch, if defective. Repair or replace the door switch harness to the control board.
	RAM = Indicating the machine setup information has been corrupted	No test available.	If error shows up frequently, replace the control board and contact Royal Vendors.
	AC Under Voltage = Indicating that the average rectified voltage was under 22VAC for more than 30 seconds.	Check for low voltage at the wall outlet at unit startup with all else on circuit running in an "extreme" condition.	If low voltage can't be found on the wall outlet in an extreme condition, check for shorts in the vendor.
	AC Over Voltage = Indicating that the average rectified voltage was over 32VAC for more than 30 seconds.	Check for high voltage at the wall outlet at the startup with all else on circuit running in an "extreme" condition.	
	System Scale Factor = Indicating one of the credit peripherals has introduced an incompatible scaling factor.	Check the connections of the changer harness. Make sure changer is plugged up and working.	Make connections to the harness or replace the changer, if necessary.
	Lost XY Position = Indicating that the controller is unable to establish where the elevator mechanism is located in its matrix.		

SECTION 5: Troubleshooting

Error Type	Detailed Error Code	Test Procedure	Corrective Action
Miscellaneous	Horiz. Home Switch = Indicating a problem with the horizontal home switch.	Check for 5 volts DC to the violet and grey wires at the vertical home switch. Check that the terminals are connected to the Com and the NO positions on the home switch.	1. If 5 volts DC is found, replace the home switch. 2. If voltage is not present, check pins 7 & 8 at pinout 5 on the control board for 5 volts DC. If no voltage is found, replace the board. 3. If voltage is found from the board, check the wiring from the board to the home switch for cut or broken wires. Replace the wiring harness, if needed.
	Sliding Port Switch = Indicating that there is a problem with the switch that detects the position of the sliding door.	Check for 5 volts DC from the orange and blue wires going to the sliding port switch. Check that the terminals are connected to the COM and NC positions on the switch.	1. If 5 volts DC found, replace the slide switch. 2. If no voltage is found, check for 5 volts DC at pins 6 and 9 at pinout 7 on the control board. If none found, replace the control board. 3. If 5 volts DC found at the control board check the wiring from the board to the switch for cut or broken wires. Replace the harnessing to the switch, if needed.
	Product Undeliverable = Indicating that there is a problem with the optical delivery detection system, or perhaps a product has been left in the delivery bin.	Check delivery bin for obstruction.	Remove any obstruction found in the delivery bin.
		Check that the wiring from the board to the delivery detection board and the emitter board are connected properly.	Reconnect the wiring properly.
	Unknown = Indicating that an error has occurred which is of unknown cause.		