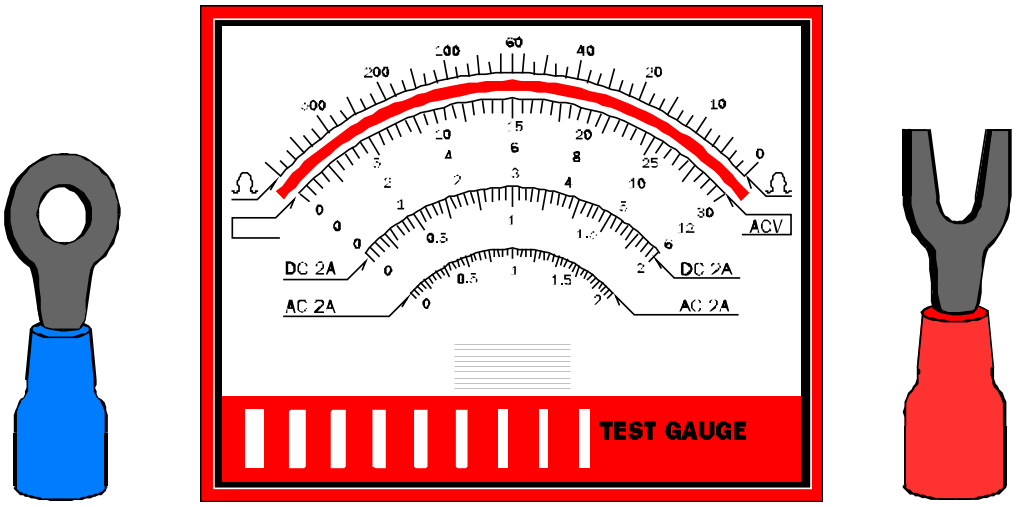
“The Book”



Sugarloaf
Technical Information
And
Troubleshooting Guides

The Book

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General Information 1

Route Merchandiser Service Skills

Safety Warnings

Basic Troubleshooting Skills

Preventive Maintenance Guidelines

and Stuff

Route Merchandiser Service Skills **Commission Compensation Programme**

- Overall prerequisites
  - Can accurately describe equipment type, and discern S/N and NAV numbers
  - Can accurately describe major components, and discern part numbers
  - Physically able to move equipment for cleaning, service and rotation
- Mechanical and Electrical skills
  - Ability to use simple hand tools
  - Ability to field replace any lightbulb
  - Ability to field replace any simple mechanical sub-assembly
  - Ability to field replace any player control
    (joystick / pushbutton / steering wheel / footpedal / etc...)
  - Ability to field replace any flexible Wire Harness
  - Ability to field replace all Printed Circuit Board assemblies
  - Ability to field replace all Micro-Switches (except soldered in place switches)
- Coin / Cash Acceptors specific skills
  - Ability to clear and clean any coin accepting mechanism
  - Ability to clear any Dollar Bill Acceptor / Stacker
  - Ability to field replace any coin accepting mechanism
  - Ability to field replace any Dollar Bill Acceptor / Stacker / Control mechanism
- Crane Machine specific skills
  - Ability to field replace string on all Transport assemblies
  - Ability to make necessary Claw Voltage and Claw Finger Gap Adjustments
  - Ability to field replace Carriage / Transport assemblies
  - Ability to field replace Claw assembly
- Digital Multi-Meter skills
  - Ability to perform a short/open continuity test
  - Ability to measure any Low Voltage Power Supply output voltages
- Programming skills
  - Ability to set +/or retrieve all game DIP switch settings
  - Ability to set +/or retrieve all game software settings

Route Merchandiser Preventative Maintenance Requirements

- Cranes
  - Replace Cabinet and Marquis lamps
  - Replace Coin Mech. lamps
  - Replace Play Button lamps
  - Replace Corner Strip lamps
- Video
  - Replace Coin Mech. lamps
  - Clean between CRT and Safety Glass
  - Tighten Console / Control and Seat hardware
  - Degauss CRT
- Bulk
  - Tighten Rack and Globe mounting hardware
  - Replace Marquis lamps
- Juke
  - Replace Cabinet and Marquis lamps
  - Replace CD's
  - Perform Volume adjustments
- Rides
  - Tighten Body and Frame hardware

WARNINGS and CAUTIONS

WARNING
DISCONNECT POWER

Always turn the power OFF and unplug any equipment before attempting service or component replacement. Installing or repairing any electrical or electro-mechanical component with the equipment plugged in could cause equipment damage and shock hazards. Use *Extreme Caution* when situations arise that the equipment must be on for Power Supply Tests -or- other adjustments that must be completed inside the cabinet.

The areas accessed for testing Power Supply voltages and other adjustments will not present a shock hazard, however there may be hazardous areas nearby you may not be aware of.

WARNING
GROUND ALL EQUIPMENT

Avoid electrical shocks. DO NOT plug in any equipment until you have inspected and are able to properly ground it. Only plug equipment into a grounded, three-prong outlet that is in good condition. DO NOT use a "cheater plug". DO NOT cut off the ground pin of the plug. DO NOT plug in to any outlet that is loose, or has exposed wires, or is obviously cracked and damaged, or is missing a suitable cover plate. DO NOT use two-wire extension cords.

CAUTION
USE PROPER FUSES

Avoid electrical shocks. Replacement fuses must be of the same size and rating as those they replace.

CAUTION
ATTACH CONNECTORS PROPERLY

Avoid electrical shock. Never pull connectors apart by their wires. This may damage and expose the wire conductors or connector pins. If connectors do not mate easily, Do Not force them. A reversed or mismatched connector may push out and expose the wire conductor or connector pins, and may cause equipment damage. Observe connector "keys" when mating. Mismatched connectors or keys may damage the connector, push out and expose the wire conductor or connector pins, and may cause equipment damage.

BEGINNING TROUBLESHOOTING
THE BASICS

NUMERO UNO. Always get as much information about the equipment's problem as possible !!! The more DETAILS you know, the easier the troubleshooting.

STOP & TALK to your location managers and customers. Communicate with the party who discovered and reported the problem if possible. -. Thank them for their concern for your equipment. Most (90%) service problems can be remedied using basic common sense and simple hand tools.

LOOK for the easiest solution. This can include coin and bill jams. hung mechanisms, loose connectors, stuck switches and important small items out of their normal positions (pads, belts and wheels, screws holding boards in place, etc.) Does everything look "normal" ?

LISTEN for abnormal noises. Is there anything hissing, buzzing or grinding ? A machine in good operational condition may sound different from a machine that has problems.

USE YOUR NOSE to smell around the mechanisms and board areas for hot or burned odors.

BE CAREFUL when changing boards. They are full of delicate, expensive electronic components. The connectors and corresponding pins are especially deserving of a light touch. Be certain they are plugged in where they belong. Be sure to secure boards and components in place with their proper screws.

BE ACCURATE. Log your test plays. When you test your machine, ringing up plays is considered non-play. You must log these in their proper place.

BE PREPARED ! A good supply of tools and parts should accompany you wherever you go. Your DMM further assure successful repairs. If your tools and parts are well stocked and organized, your chances of quick repair at greatly increased.

DON'T PANIC ! Random, haphazard board switching only leads to frustration and confusion. Isolate your problem before changing boards. There are many resources for you to draw from to fix a machine: a service manual, your manager, other drivers and of course Sugarloaf's Technical Services Department.

When you complete your service call, hunt down your contact at the account and thank them before you leave. These short meetings will enhance and define your RELATIONSHIP with your account.

SUGARLOAF Crane Equipment Preventive Maintenance Guidelines

By using a defined schedule of observations, problems can be caught before causing machine down time. Examples:

1. Replacing a frayed string before it breaks.
2. Checking DBA before it jams-up.
3. Cleaning a coin mech. before accumulated crud causes coin jams.
4. Observing a loose drive wheel before it causes the carriage to not move or fall.

DAILY

1. Visually inspect each coin mech., press in each coin reject button and clear out coin mech. Look for jammed coins and junk.
2. For Rowe OBA DBA's, open mechanism lid and look for stuck paper and junk. Blow off the Sensor and check the belts.
3. For Mars AE (plastic) DBA's, remove optical sensor assembly and look for stuck paper and junk. Wipe off sensor face with clean, damp cloth.
4. Put a quarter through each coin mech. and run $1 and $5 through DBA. If money is not taken the FIRST time, look for the cause and repair it. Log test plays as required.
5. Play the machine. Run bridge right to left, then back to front and drop the claw. Look for frayed areas on string and for bent or sticking claw fingers. Watch claw for signs of broken wire in coil cord. See that bridge returns to home position and machine resets. Repair as needed.
6. Replace dead marquee, coin return and cabinet bulbs

WEEKLY

1. Clean rails and wheels. Make sure that drive wheels are tight on drive shaft.
2. Tighten loose nuts and bolts on control console, coin mech. plates and DBA mounting plate.
3. Check buttons or joystick for tightness.
4. Make sure all PCBs and cable connectors are secure.
5. Look for loose screws that have fallen on or under boards.

MONTHLY

1. Check AC cord, plug and outlet for crushed or frayed areas.
2. Verify smooth lock operations and proper door alignment. Lube locks with graphite powder if sticky.
3. Check cabinet for cracks, chips, loose T-molding, etc.. Repair ASAP.

By making these simple steps a part of your routine, you can be assured that your Toy, Beanie & Fun Shoppe revenues will be maximized and machine downtime minimized. Try it!

SUGARLOAF Video Equipment Preventive Maintenance Guidelines

Using the same observation and Preventative Maintenance values and expertise (and Success !) we have had with Crane Games, problems can be caught before causing machine down time. Examples:

1. Checking a DBA before it jams-up.
2. Cleaning a coin mech. before accumulated crud causes coin jams.
3. Checking the game controls and video screens for proper operation to maximize the player experience.
4. Checking for loose control and cabinet hardware that may cause further game damage or become a hazard to players.
5. Keeping the game clean and inviting for new AND repeat players.

DAILY

1. Visually inspect each coin mech., press in each coin reject button and clear out coin mech. Look for jammed coins and junk.
2. For Mars AE (plastic) DBA's, remove optical sensor assembly and look for stuck paper and junk. If necessary, wipe off sensor face with clean, damp cloth.
3. Put a quarter through each coin mech. and run $1 through the DBA. If money is not taken the FIRST time, look for the cause and repair it. Log test plays as required.
4. Tighten loose nuts and bolts on the control console, coin mech. plates and DBA mounting plate and/or coin doors.
5. Tighten buttons / steering wheels / joysticks / foot pedals / gun cables / etc...
6. Play the game: do the buttons / steering wheels / joysticks / foot pedals / guns / etc... operate correctly ? Does the video action follow with your inputs ? Do the game sounds follow the video action ? Does the game appear to play "smoothly" through and finish with a feeling you 'got your money's worth' ? Repair as needed.
7. Replace dead marquee, coin return and cabinet bulbs
8. Clean the screen, seat, control panel, cabinet face, foot well and any visible surface.

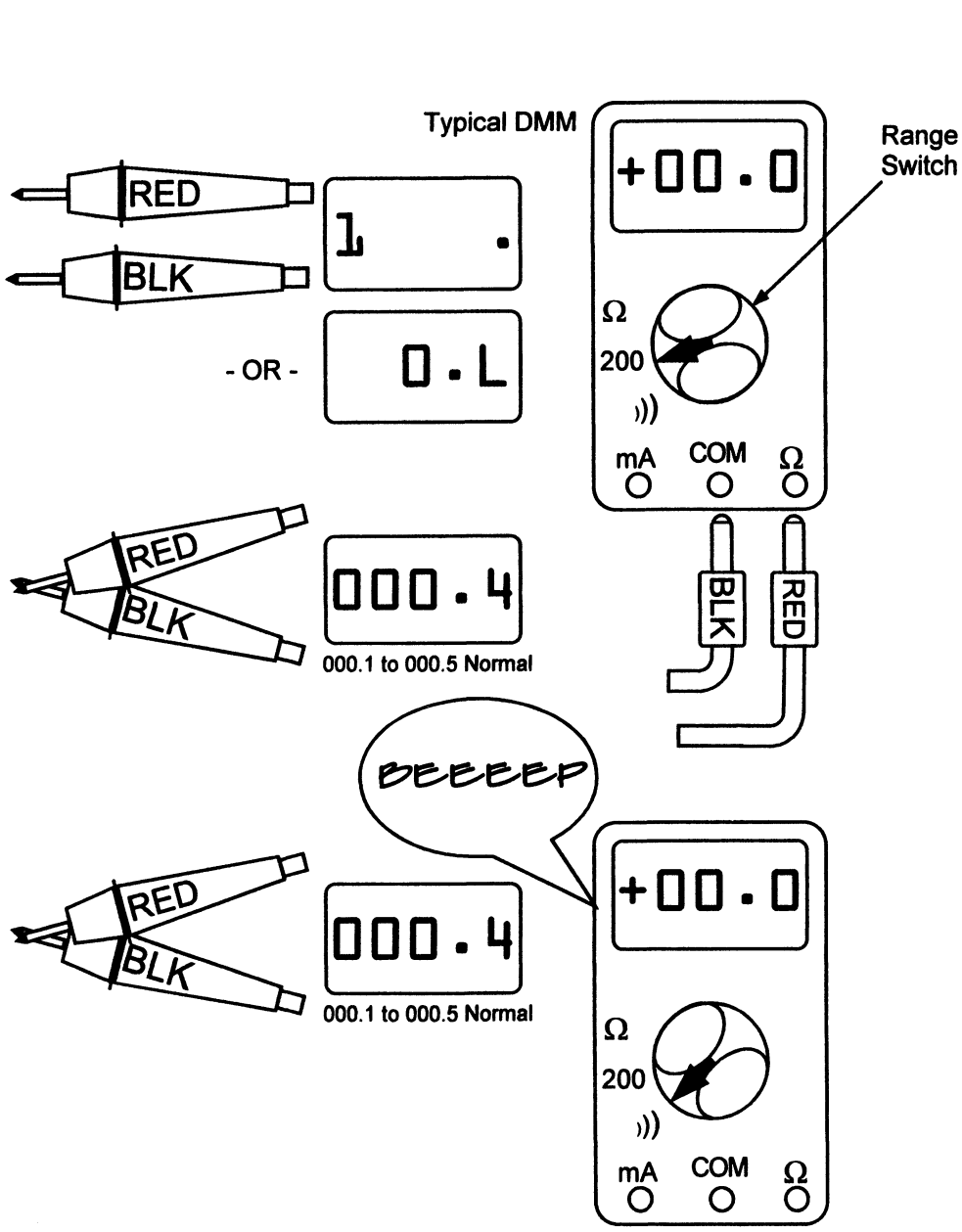
WEEKLY

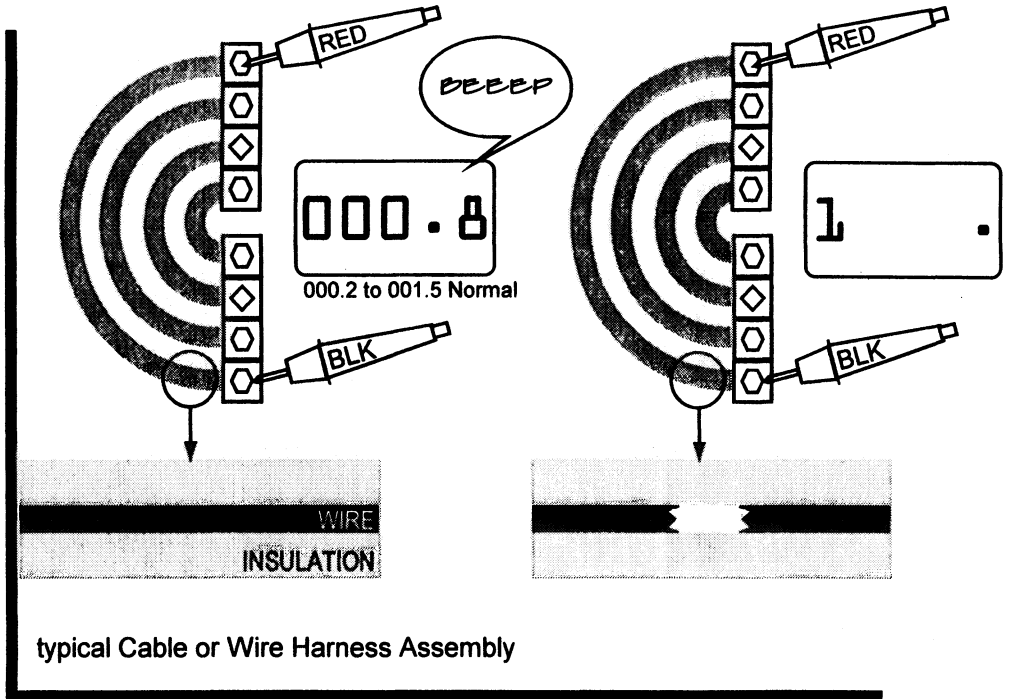
1. Make sure all PCBs and cable connections are secure.
2. Look for loose screws that may have fallen out.

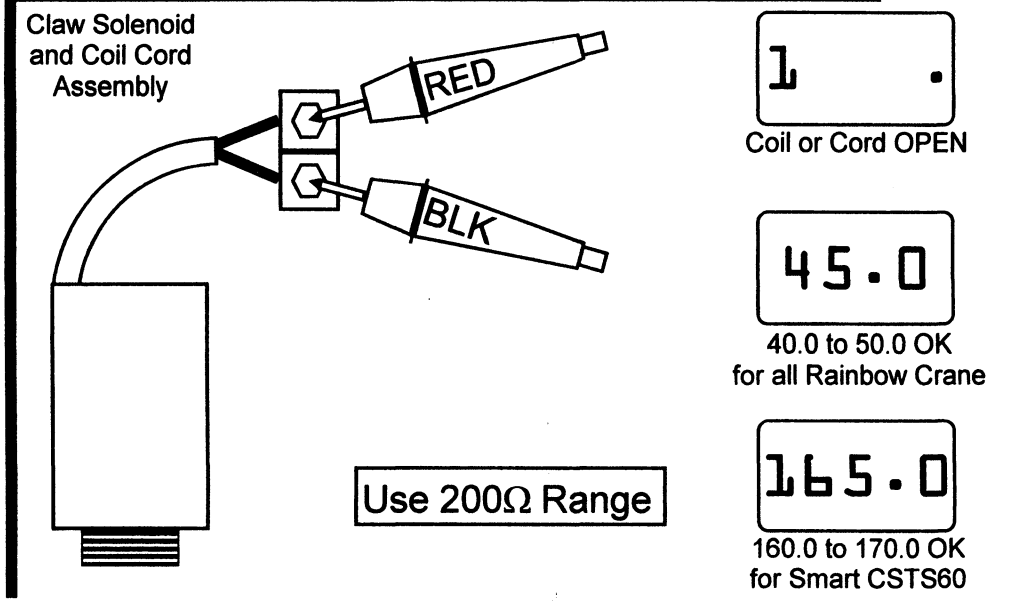
MONTHLY

1. Check AC cord, plug and outlet for crushed or frayed areas. Check link cables too.
2. Verify smooth lock operations and proper door alignment.
3. Check cabinet for cracks, chips, loose T-molding, etc.. Repair ASAP.
4. Clean between the monitor safety glass and picture tube (check the manual !)
5. Vacuum out the dirt and dust bunnies from inside the cabinet, pay special attention to the fans, power supply, video chassis and open game boards.

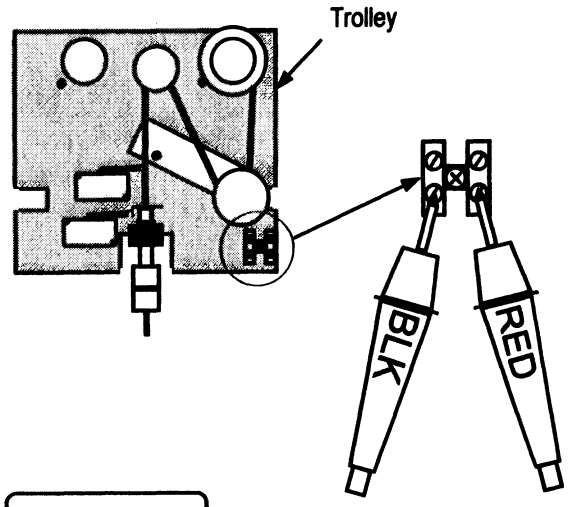
By making these simple steps a part of your routine, you can be assured that your revenues will be maximized and machine downtime minimized. ***Try it !***

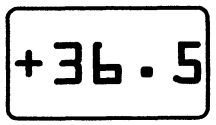






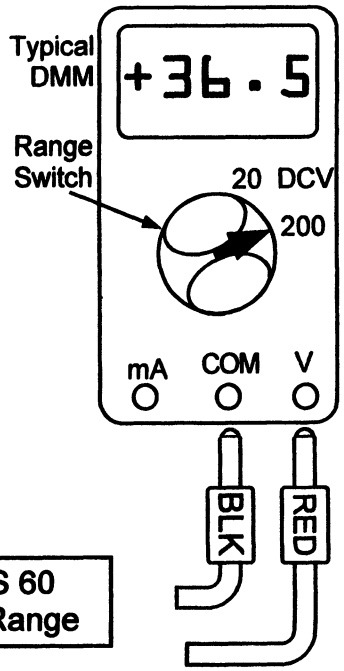
Using a DMM
Continuity and Resistance Measurements

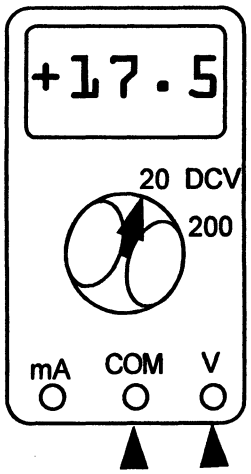




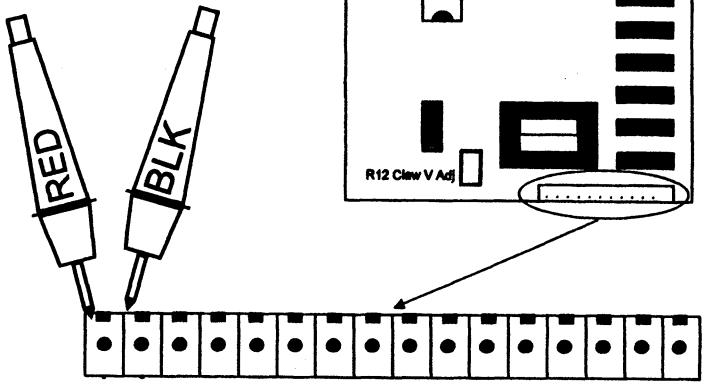
35.0 to 38 is w/in Normal Range

SMART CSTS 60
Use 200 VDC Range

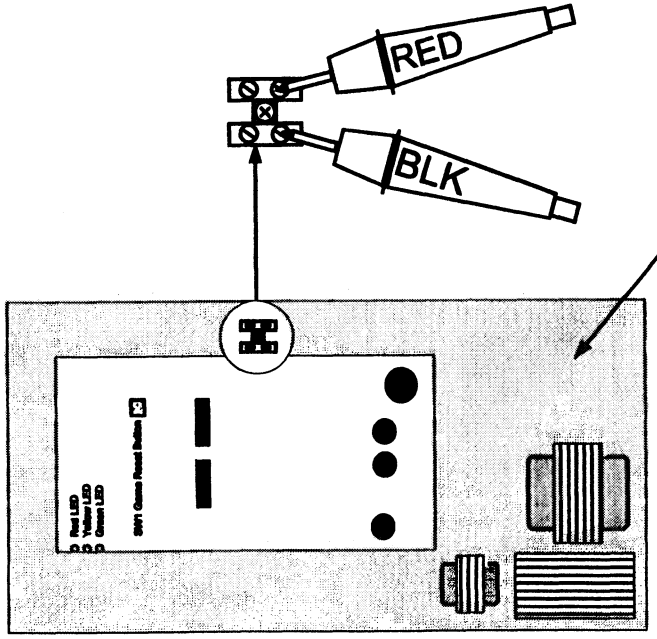




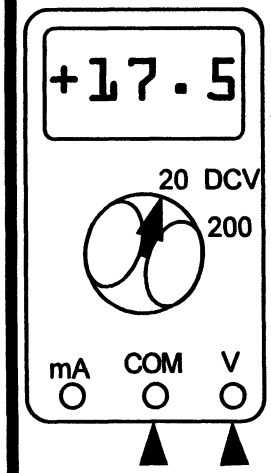
15.5 to 19.5 is w/in Normal Range



Rainbow Classic 42" - 60"
Use 20 VDC Range

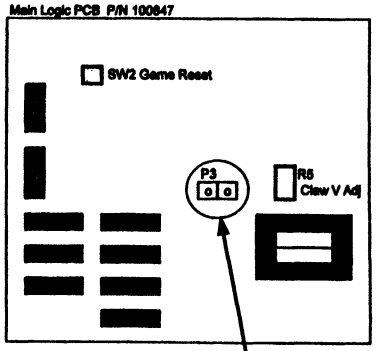


Swing-Forward Panel behind Service Door. >Terminal Strip, as shown, may not be present<

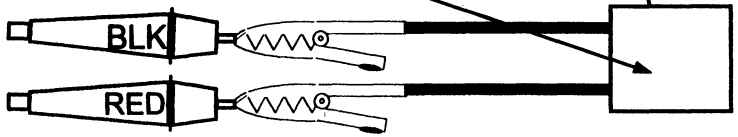


Rainbow CM30 / NC30 - NC42 - NC60 - WC42
Use 20 VDC Range

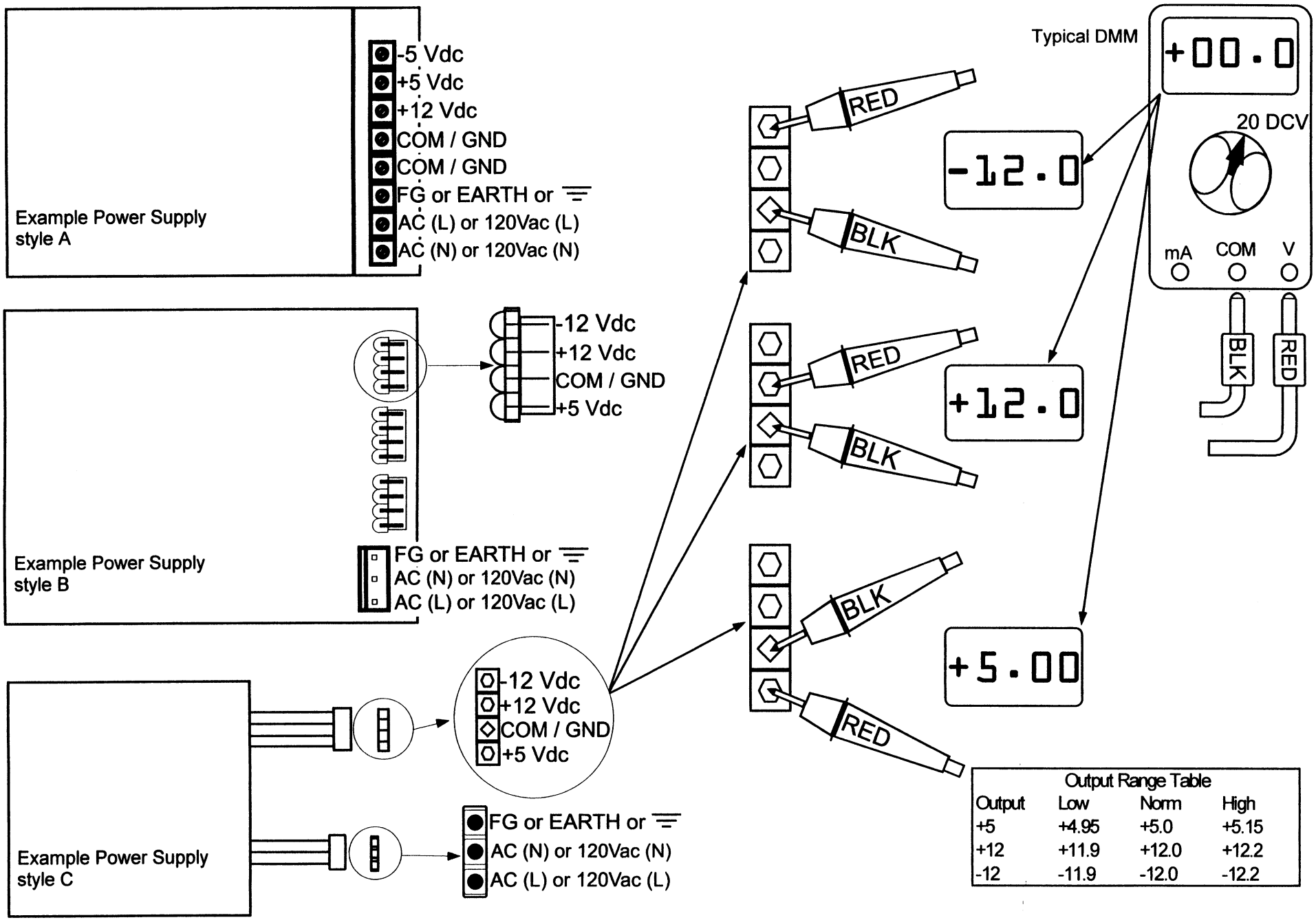
15.5 to 19.5 is w/in Normal Range



Use Adapter between probes and Main Logic Board P3



Using a DMM
Claw Voltage Measurements



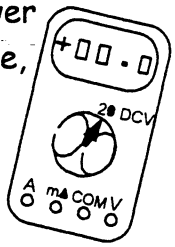
Output Range Table			
Output	Low	Norm	High
+5	+4.95	+5.0	+5.15
+12	+11.9	+12.0	+12.2
-12	-11.9	-12.0	-12.2

Using a DMM
Power Supply Voltage Measurements

FIELD DIAGNOSIS OF GAME POWER SUPPLIES.

These devices do exactly what their name implies; they supply power to the computer portion of every game out there.·

The only items necessary are 1) the game in question, 2) a decent quality DMM (Digital Multi-Meter) and 3) the game service manual or a clearly visible label on the power supply. This last item is THE most important tool... a goof-up here can cause game, meter, or human damage.



Refer to the following page illustrating 3 common styles of power supplies. You'll notice power supply connections may come in the form of screw-terminals, push-on c onnectors mounted directly to the Power Supply, or cables with connectors. The size, shape and color matter not, nor do the order in which each terminal appears - though it certainly does matter what you connect to. That's why you need the manual or a visible label.

Power supplies need to be checked when the game begins to act erratic; like resetting in mid-play, erasing remaining plays, not responding to player controls correctly, screen jumping, or strange noises emitting from the computer drives in certain video games. A black and quiet game may also result from a bad power supply, but check that it's plugged in and turned on first. A bad power supply may be due to some other game component going bad —*OR*— it may cause damage to other game components, particularly video game CPU boards and data drives.

Practice on a good game in the warehouse. Read the illustration page of this and the game manual, and dig in. Turn your meter on, set it to the 20VDC range, make sure the game is on, connect the leads as shown... and measure away. WE ARE NOT going near open connections of the 120Vac wallplug wire connections, so there will be no shocks, curled and smoking hair or flaming blue molten globs of copper. There are primarily 3 very safe voltages we are looking for: +12 Vdc, +5 Vdc and -12 Vdc, and some games may be slightly different than these, there's that manual need again. The values must be exact, refer to the *Range Chart* for acceptable high and low limits. If any one value is too high or too low, the power supply must be replaced. The measurements must also remain steady, if it is 'jumping around", its probably getting ready to puke.

When in doubt: REPLACE IT... it's among the cheapest components in a game, will be good for the game's health, and necessary for your ability to troubleshoot other problems.

Remember; eliminate everything it can't be and the only thing left is what it must be.

Code	RBC Classic	RBC CM30 / NC / WC	RBC Fun	Smart 6th Gen Toy
1		RAM Error	RAM Error	RAM Error
2			Bridge Home Error	ROM Error
3		Claw Home Fail	Claw Home Fail	
4		Carrige Home Fail	Left Limit Open	
5		Xport Home Fail	Forward Limit open	
6		Left Limit Jam	Left / Right Limit Closed	
7		Right Limit Jam		
8		Fwrd Limit Jam	Front / Rear Limit Closed	
9		Rear Limit Jam	Claw-Up Limit Closed	
10		Claw Up Limit Jam		Claw / Bridge Home Fail
11		Claw Tension Limit Jam	Claw-Up Limit Open	
12		Right Limit Open		
13		Rear Limit Open		
14		Game Counter	Game Counter	
15			Prize Detector Error	
16		Prize Detector Error	Claw Tension Fail @ PowerUp	
17		Left Joystick Error	Left Joystick Error	
18		Fwrd Joystick Error	Rear Joystick Error	
19		Right Joystick Error	Right Joystick Error	
20		Rear Joystick Error	Fwrd Joystick Error	
21		JS Claw Close Error		
22		Claw Drop Switch Error	Claw Drop Switch Error	
24		CPU Interrupt		
33	Bridge Home Fail in Game			
44	Claw Home Fail			
55	EPROM Fail			
66	Bridge Home Fail @ StartUp			
69				CPU Fail
88	Eqpt in Maintenance Mode			
98	Eqpt in Life Cycle Mode		CPU Interrupt	
99		Check DIP Switches		

Dollar Bill Acceptors 2

CoinCo BA32R

Mars AE2411

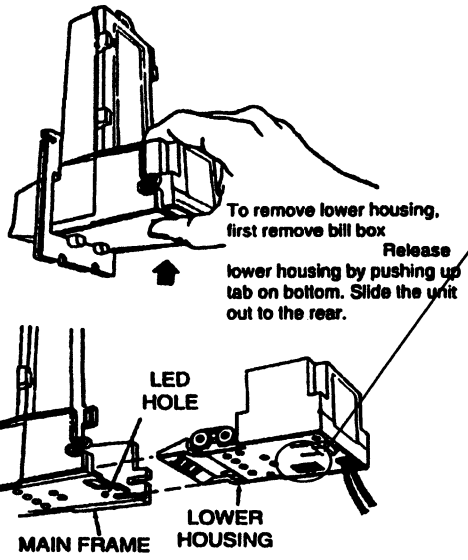
Mars AE2451

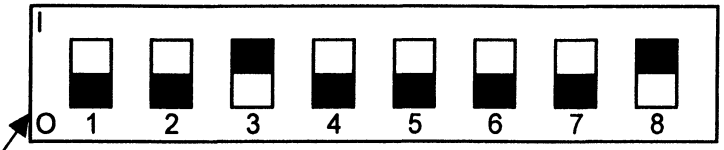
Mars VFM-3

Rowe OBA

	A F Race	A&A EBV	GrayHound	Noel LAX	QS Merlin	QS Showcase	RBC Classic	RBC CM24	RBC CM30	RBC NC	RBC WC	Rowe CD-RN Juke	Roew BC35 / 3500 Change	Rowe Century Changer	Sammy	Smart BC	Smart CSTS	Smart TS	T 'n J Mr. Bill	Video Games
Ardac 88X Series			X																	
CashCode 150										X						X				X
CashCode 164							X			X										
CashCode Amazing							X			X										
CashCode Simplex					X															
Coin Controls BA32		X				X													X	
Mars AE24xx									X	X				X	X		X	X		X
Mars AE2600																				
Mars AL2											X									
Mars VFM2			X																	
Mars VFM3											X									
Mars VFM4											X									
Mars VFM5											X									
Rowe CBA2	X											X								
Rowe OBA			X				X	X	X	X	X									
Rowe BC20													X							
Rowe BC30													X							
Rowe VBA7														X						
Japan Cash Machine DBV20				X																
Other																X				

DBA Matrix





Switch Settings

1	2	3	4	5	6	7	8	
O								On = High Security
	O							Off= Two way accept
		I						Reserved
			O					On accepts $20
				O				On accepts $10
					O			On accepts $5
						O		On accepts $2
							I	On accepts $1

Troubleshooting

Dead	Check Power
	Check Connectors
	Check for jammed bill or object
	Replace DBA

Poor	Clean bill path
Acceptance	Replace DBA

Bills	Clean bill path
Jam	Stacker Box loose or misaligned
	Replace DBA

MARS 2000 Series Bill Acceptor

About half of the bill acceptors in the field are the Mars 2000 Series. The Mars 2000 is a Bill Transport, Control Unit and Stacker….All in One!!

There are several adjustments and repairs that can be made to the Mars 2000 Series in the field. Here are a few examples:

The most common routine maintenance problem is obstructions in the bill path. To clear an obstruction, push down on the metal bar while pulling out on the detection unit. Then, remove the foreign object from the channel. And finally, snap the detection unit back in place

When cleaning is required, use a soft cloth moistened with Windex to wipe the smooth clear plastic bill path. All of the Sensors are embedded under this bill path. Be sure to clean the white rollers as they can accumulate dirt and interfere with bill acceptance.

Now we'll discuss the DIP Switch settings. With all DIP switches OFF, the MARS 2000 Series will have the following options enabled: Accepts $1, $2 and $5 bills, Four Way Accept, High Security Accept, and One Pulse Per Dollar.

- ✓ Accept $1, $2 and $5 bills
- ✓ Four Way Accept
- ✓ High Security Accept
- ✓ One Pulse Per Dollar

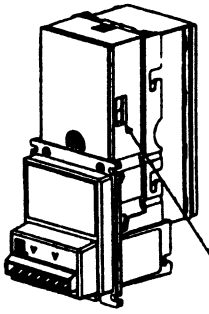
Placing ANY switch ON will override these options (including any card programmed functions) and the Bill Acceptor will operate according to the switch settings label located on the unit. Sugarloaf's Toy/Treasure/Beanie Shoppes manufactured by Rainbow and Smart should use the following configuration:

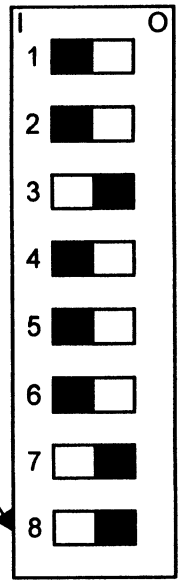
1) Switch 1 and Switch 2 should be ON for 4-Way acceptance.
2) Switch 3 should be OFF for High Acceptance
3) Switches 4,5 and 6 should be ON for $1, $2 and $5 bill acceptance
4) Switch 7 should be ON for 4 pulses per dollar
5) Switch 8 should remain OFF

An ICE Crane should be set to the same configuration with one exception. The ICE crane is programmed to recognize the pulse from the bill acceptor and emit 4 pulses. So, the ICE crane should have DIP switch #7 in the OFF position.

During normal operation, the Diagnostic light signal should be a constant red. If it is flashing, use the following as a troubleshooting guide:

1) One Flash = Bill Path Jammed
2) Two Flashes = disabled from mech/VMC
3) Three Flashes = Needs cleaning
4) Four Flashes = cross channel blocked
5) Five Flashes = magazine removed
6) Continuous slow = unit failure, replace
7) Continuous fast = stacker full





FUNCTION DIP Switch Settings

1	2	3	4	5	6	7	8	
I	O							Two way bill acceptance
O	I							One way bill acceptance
I	I							Four way bill acceptance
		O						ON Increases Acceptance
			I					On accepts $1
				I				On accepts $2
					I			On accepts $5
						O	O	Credit Pulse Timing

I = ON / O = OFF

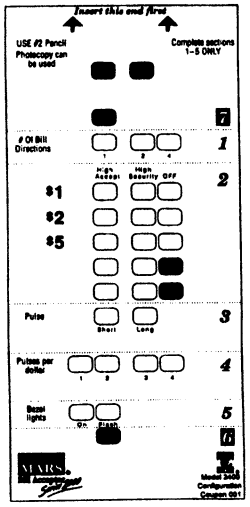
O O O O O O O O Settings when Coupon set-up is used on Smart CSTS60

I I O I I I O O Setting for MOST Video Games -or- non-Coupon Smart CSTS60

I I O I O O O O Settings for HydroThunder Video Game

COUPON Programming Steps

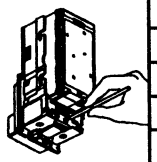
Coupon shown is not actual size



1: Use an original coupon from a Mars Installation Guide

2: Fill out the Coupon using a #2 Pencil. One block From each line MUST be completely filled in. Do Not mark-Up anywhere else on the Coupon.

3: Depress SERVICE Button once on the DBA back.



4: Insert Coupon as indicated then verify settings were accepted;

> OK if Coupon returned immediately and LED flashes 10 times.

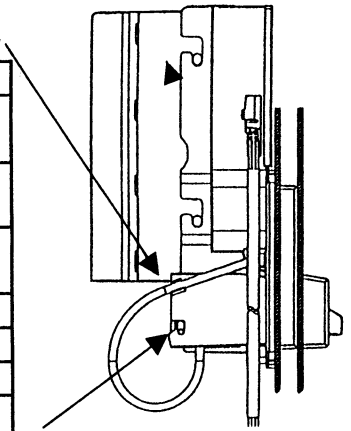
> FAILED if Coupon is held 10 sec. LED will flash the same number of times as the rejected Coupon section.

Troubleshooting

Led adjacent to SERVICE Button on the rear is:

ON	Functioning Normal
OFF	Power off Check Connections and Game power
One Flash	Paper Path Jammed Remove Jam Clean Optics
2 Flashes	Unit disabled Check DIP Switch #8
3 Flashes	Needs Cleaning
4 Flashes	May need cleaning
5 Flashes	Stacker box not seated or missing
Continuous Slow	System Failed Replace DBA
Continuous Fast	Stacker box full

DBA Takes bill but game will not credit
Check DIP Switches #7 and 8 are OFF / Replace DBA



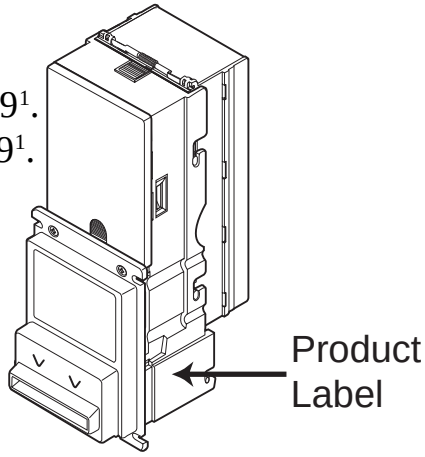
Lift UP on metal bar, then pull BACK to clean Optics. Use only clean cloths with mild non-abrasive cleaner.

SERIES 2000 SOFTWARE EPROM LOCATION

Identify the type of the Series 2000 Bill Acceptor by checking the product label.

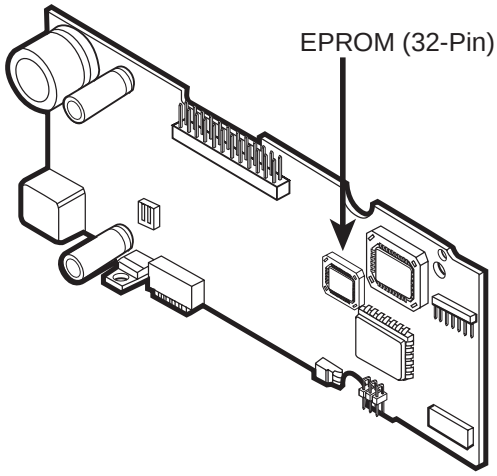
Series 2000 with MEI FlashPort:

- All AE2600
- VN2500 manufactured during or after the 40th week of 1999[1].
- AE2400 manufactured during or after the 40th week of 1999[1].



[1]**NOTE:** The first two digits of the serial number represent the week the unit was manufactured (1-52). The third digit represents the year the unit was manufactured.

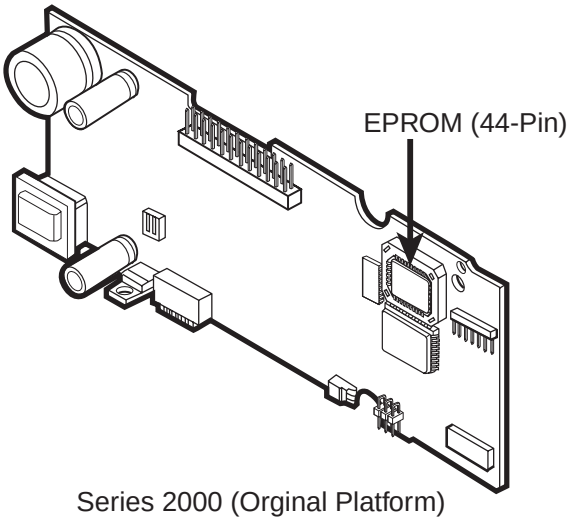
S/N 499XXXXXXXX - unit manufactured the 49th of 1999



Series 2000 with MEI FlashPort

Series 2000 (Original Plaftform):

- VN2500 manufactured prior to the 40th week of 1999[1].
- AE2400 manufactured prior to the 40th week of 1999[1].



Series 2000 (Orginal Platform)

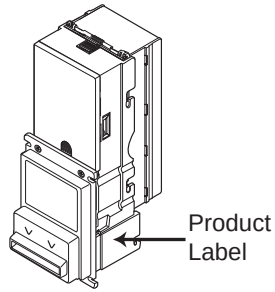
MEI
Bill Acceptor Series 2000 with MEI FlashPort

SERIES 2000 EPROM REPLACEMENT KIT
P/N: 250068065

REPLACEMENT GUIDE

The E-Prom Replacement Kit includes all the necessary equipment needed to replace the EPROM for the following Bill Acceptors:

- Series 2000
  - VN2500
  - AE2400
- Series 2000 with MEI FlashPort
  - VN2500[1]
  - AE2400[1]
  - AE2600[2]



[1]**NOTE:** MEI started manufacturing the VN2500/AE2400 with MEI FlashPort on the 40th week of 1999. To verify if a unit was manufactured with MEI FlashPort capability check the product label for the words "with MEI FlashPort" or check the serial number of the unit to determine when it was manufactured. The first 2 digits of the serial number represent the week the unit was manufactured (1 - 52). The third digit represents the year the unit was manufactured (5 - 0).

S/N 499XXXXXXXX - unit manufactured the 49th week of 1999

[2]**NOTE:** All AE2600 have MEI FlashPort capability.

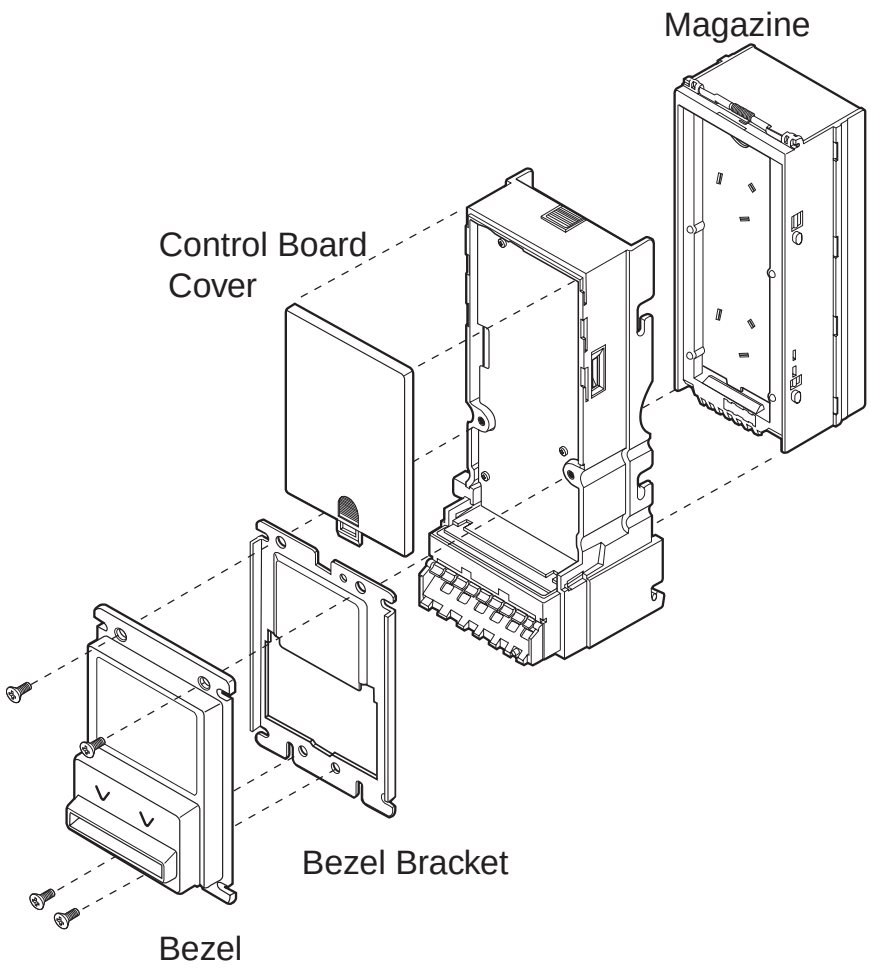
The E-Prom Replacement Kit consist of the following:

- Wrist Grounding Strap
- Chip Extractor
- Replacement Guide

Part # 250067052
Printed in USA
Rev. G1

REMOVING THE OLD CHIP

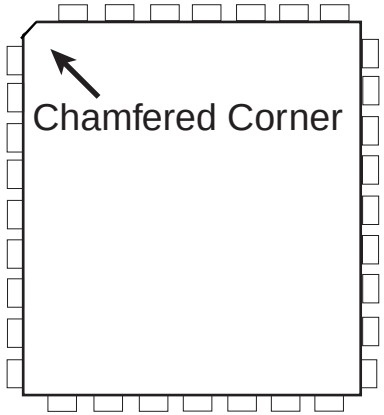
1) Remove the Bezel screws. Then carefully remove the Bezel. If necessary remove the Bezel Bracket screws. Then remove the Bezel Bracket and Control Board Cover.



Questions should be directed to MEI Technical Support at 1-800-345-8172 or our web site: www.meiglobal.com .

INSTALLING THE NEW CHIP

1) Identify the chamfered corner of the new chip.



2) Align the chamfered corner of the new chip with the chamfered corner of the chip socket.

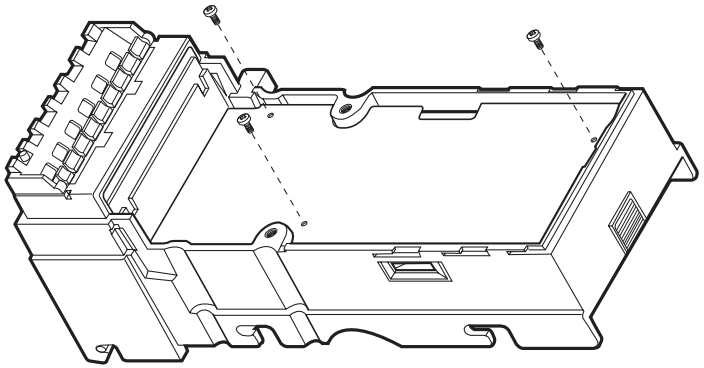
3) Press the chip into the chip carrier.

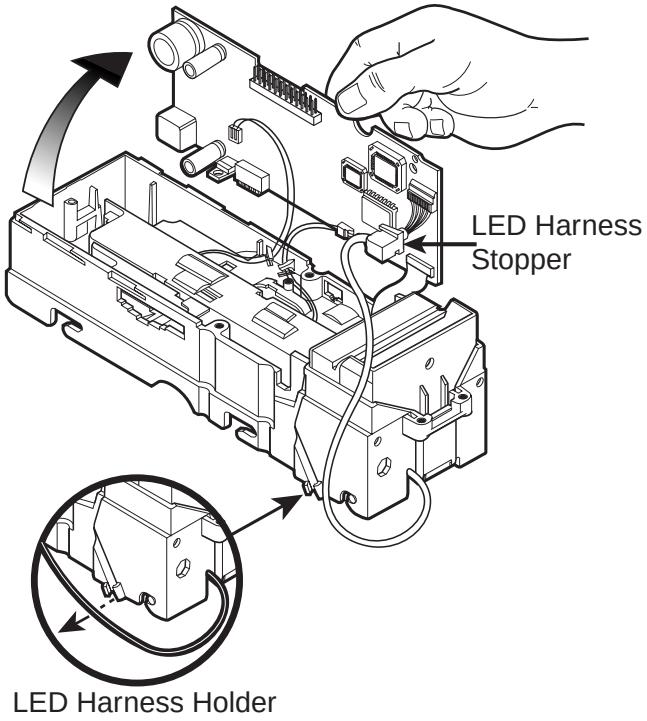
The chip carrier should receive the chip without much effort. **DO NOT FORCE THE CHIP INTO THE CHIP SOCKET!** If the chip does not install easily, recheck the alignment of the chip to the socket.

NOTE: Make sure the chip is firmly in place - press on all four corners of the chip. **DO NOT USE A SCREWDRIVER OR ANY OTHER SHARP METAL INSTRUMENT TO PERFORM THIS TASK.**

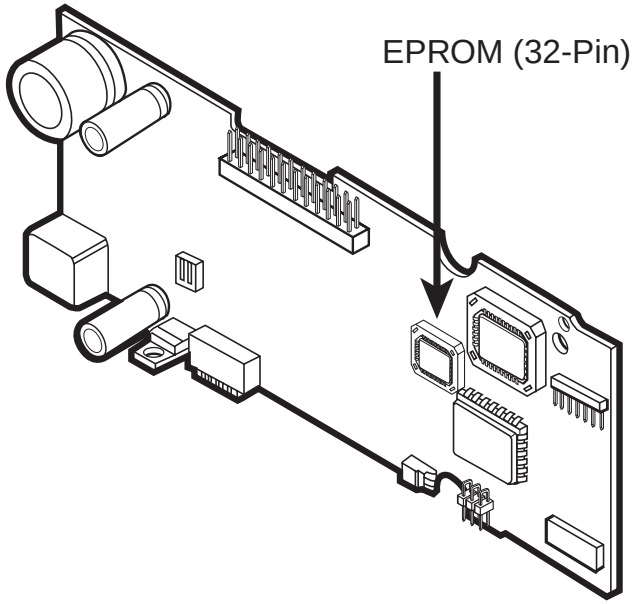
4) Ensure the harnesses connected to the Control Board are seated properly then reassemble the unit.

2) Remove the LED Harness from the LED Harness holder. Remove the Magazine and then lay unit on its back and remove the Control Board screws. Gently remove the Control Board by lifting on the LED Harness Stopper, then lift on side of the Control Board as shown below.

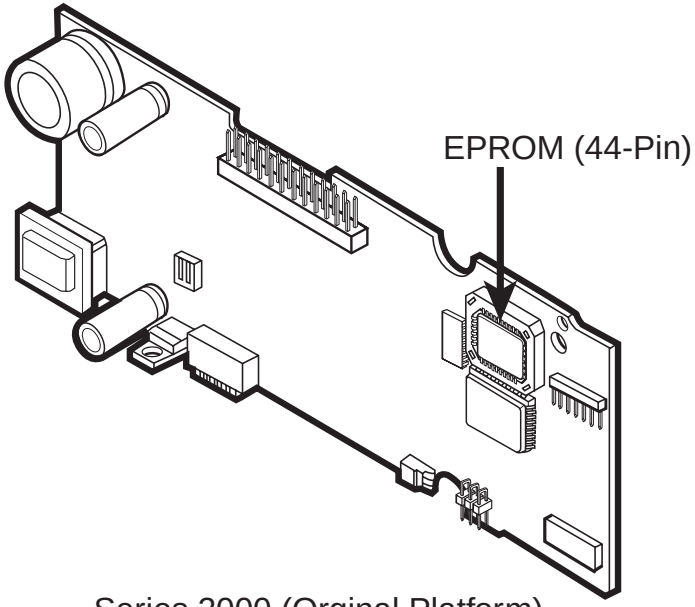




3) Locate the EPROM socket on the Control Board.

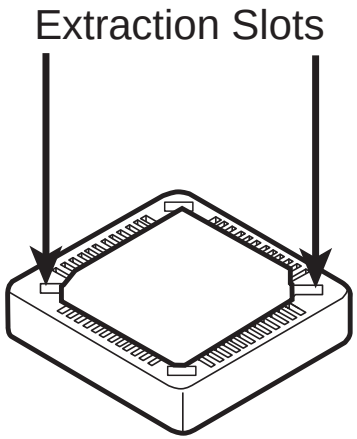


Series 2000 with MEI FlashPort

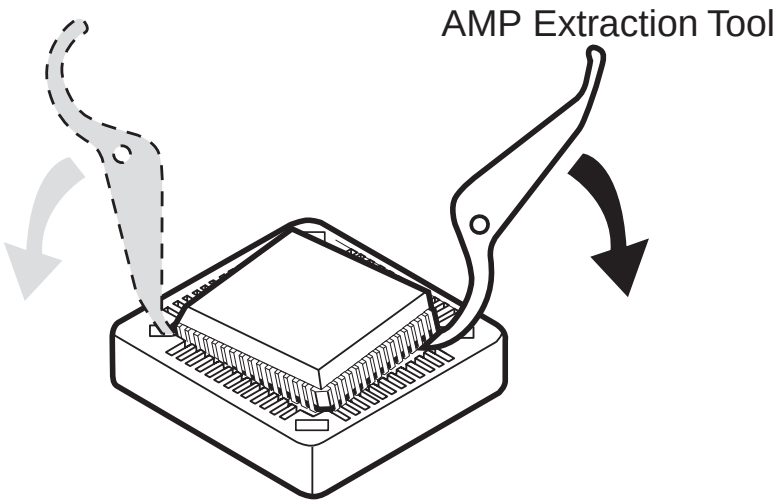


Series 2000 (Orginal Platform)

4) Remove the EPROM from its socket. Use an AMP extraction tool for plastic leaded chip carriers or equivalent tool. Locate the extraction slots.

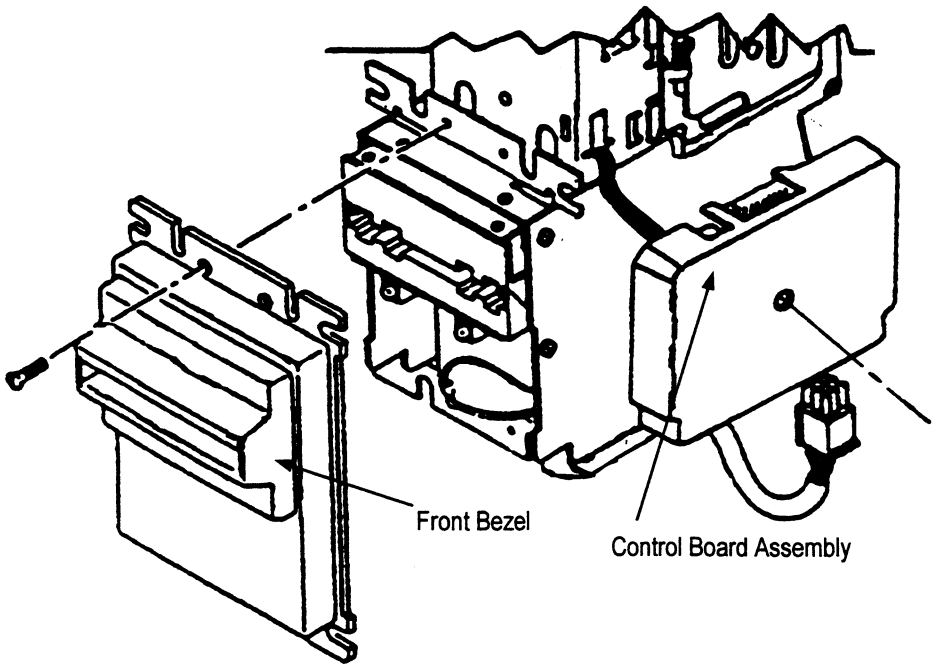


5) Lower the extraction tool into the extraction slot until it bottoms out. Then pull the tool back away from the socket using slight pressure until the corner of the chip lifts away. Repeat on the opposite extraction slot and lift the chip out of the socket.



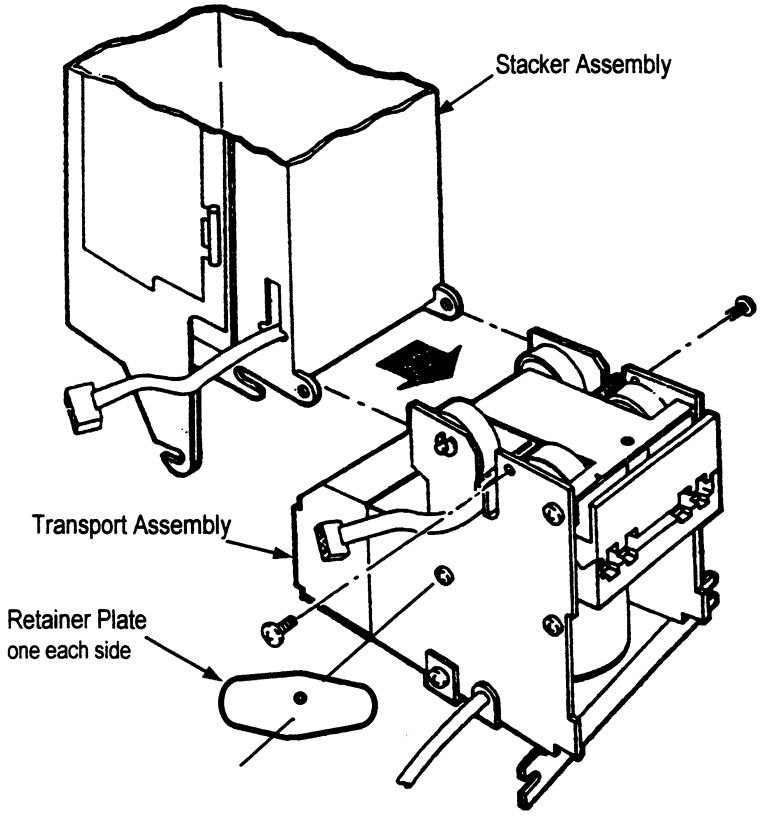
MARS VFM AND AL SERIES CLEANING TIPS

a) Work in a clean, bright area such as at a table. Don't try this working on a carpet or inside the machine.
b) Set the DBA with the bill opening at the bottom facing towards you.
c) Work to the Left and to the Right....take the screws from the left of the DBA and set them on your left \
take the screws from the right of the DBA and set them on your right.
d) Pay attention to screw lengths as they are removed. Don't remove any other screws than shown.
e) Reassemble completely, check for "leftovers".



STEP 1
Remove four screws holding the Front Bezel. Note that there are 2 lengths of these screws. Do not lose front Bezel Spacer.

STEP 2
Remove single screw holding the Control Board Assembly. Do not force or strain several flat cables running between the DBA and Control Board. Note the relative positions of these cables for re-assembly.

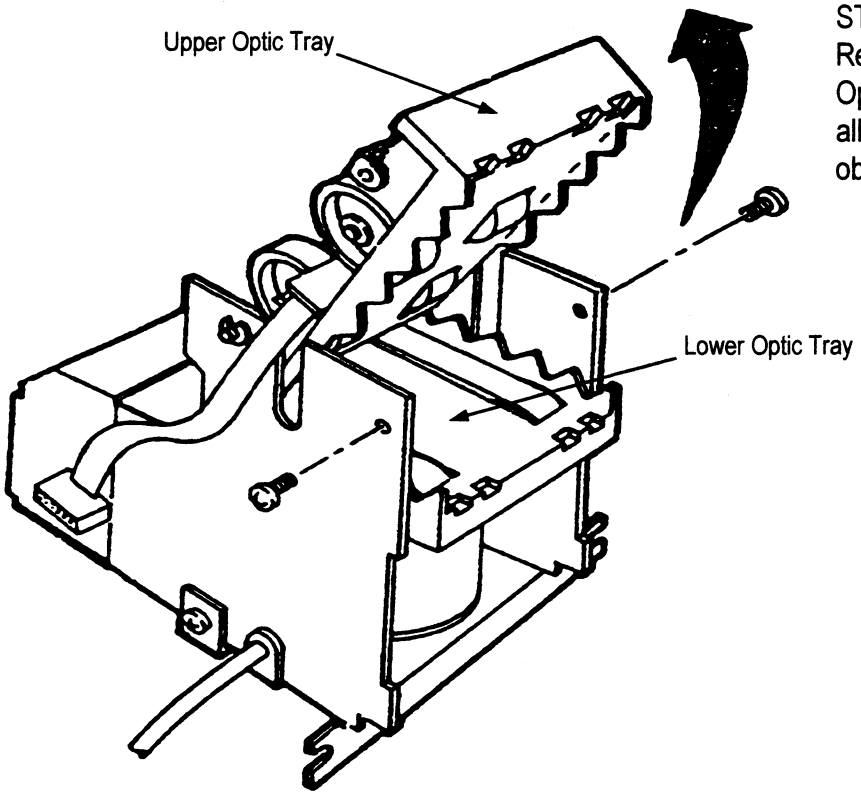


STEP 3
Remove two upper screws holding the stacker to the transport assembly.

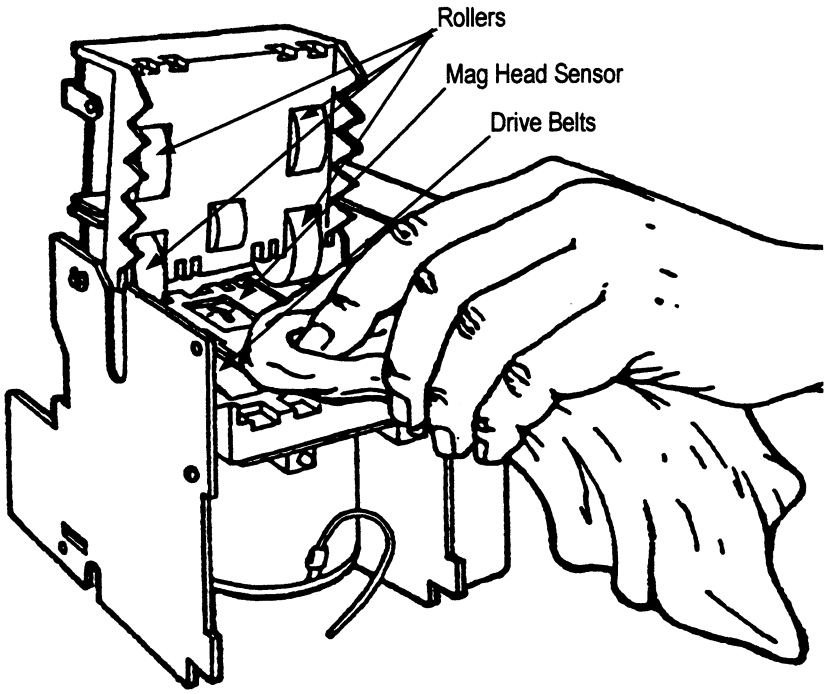
STEP 4
Remove two lower screws that pass through retainer plates on each side, then remove the retainer plates.
HINT: using a pencil or fine marker, trace around each of the retainer plates, and mark each plate "L" and "R" as you face the unit. This will help orient these plates during re-assembly.

STEP 5
The stacker assembly will pull away from the Transport assembly. The flat cables require careful handling, but do not need to be disconnected.

Mars VFM-3 and AL Series DBA Field Cleaning Detail



STEP 6
Remove two **short** screws securing the Upper Optic assembly and open as shown. This allows access to the bill path. Any stuck objects will become very obvious at this point.



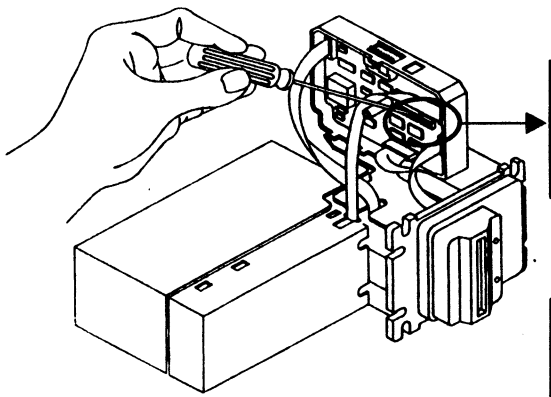
STEP 7
Remove any foreign objects and clean the Upper Optic and Lower Optic Trays (Red Plastic) using a soft cloth dampened with Denatured Alcohol. IF the Upper and Lower Optic Tray surfaces are scratched or damaged, replace the entire DBA.

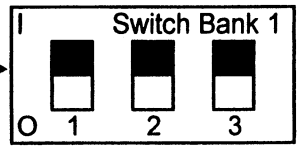
STEP 8
Inspect and clean the black and white Pinch Rollers and belts, again using Denatured Alcohol. If either black Pinch Roller surface is gouged or beveled, or if the belts are worn or shredding, replace the entire DBA.

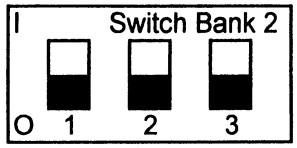
STEP 9
Reassemble the DBA in reverse order.

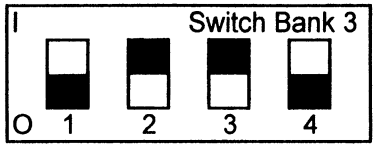
Mars VFM-3 and AL Series DBA Field Cleaning Detail

Mars VFM-3 DIP Switch Programming









Switch Bank 1 Settings

1	2	3	
I			On accepts $1
	I		On accepts $2
		I	On accepts $5

Switch Bank 2 Settings

1	2	3	
I			One way bill acceptance
O			Two way bill acceptance
	I		Increases Security
	O		Increases Acceptance
		O	Reserved

Switch Bank 3 Settings

1	2	3	4	
O				Credit Pulse Timing
	O	O	O	1 Pulse per Dollar
	I	O	O	2 Pulses per Dollar
	I	I	O	4 Pulses per Dollar

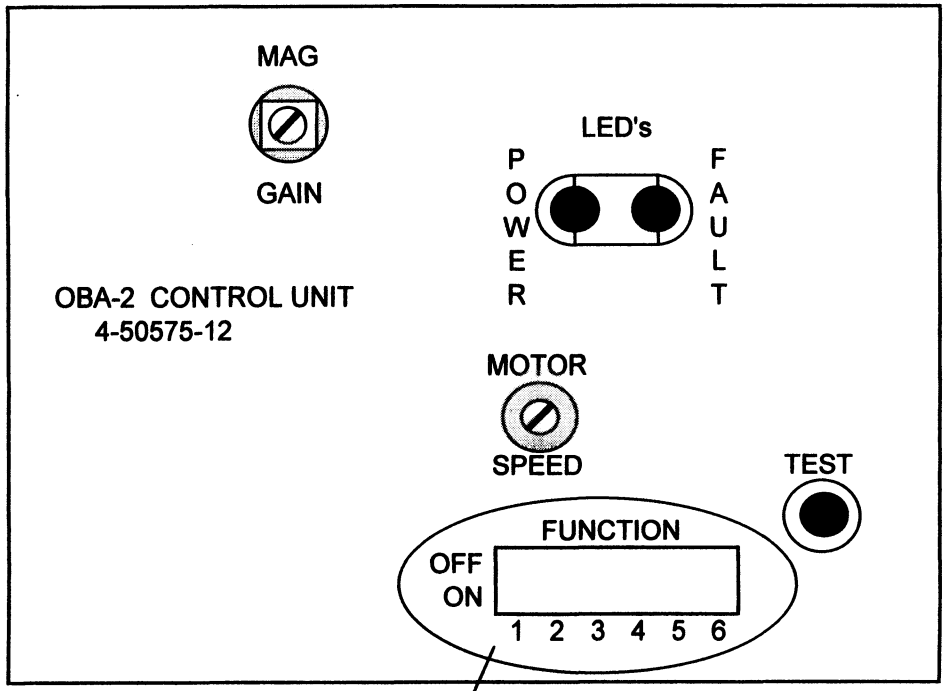
Standard VFM-3 Settings: I I I O O O O I I O

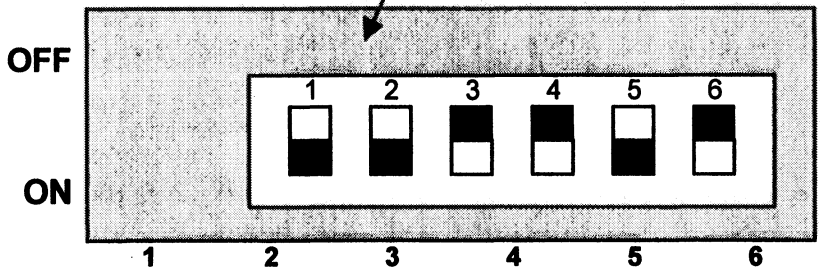
Troubleshooting

Dead	Check Power
	Check Connectors
	Check for jammed bill or object
	Replace DBA

Poor	Clean bill path
Acceptance	Replace DBA

Bills	Clean bill path
Jam	Stacker Box loose or misaligned
	Replace DBA



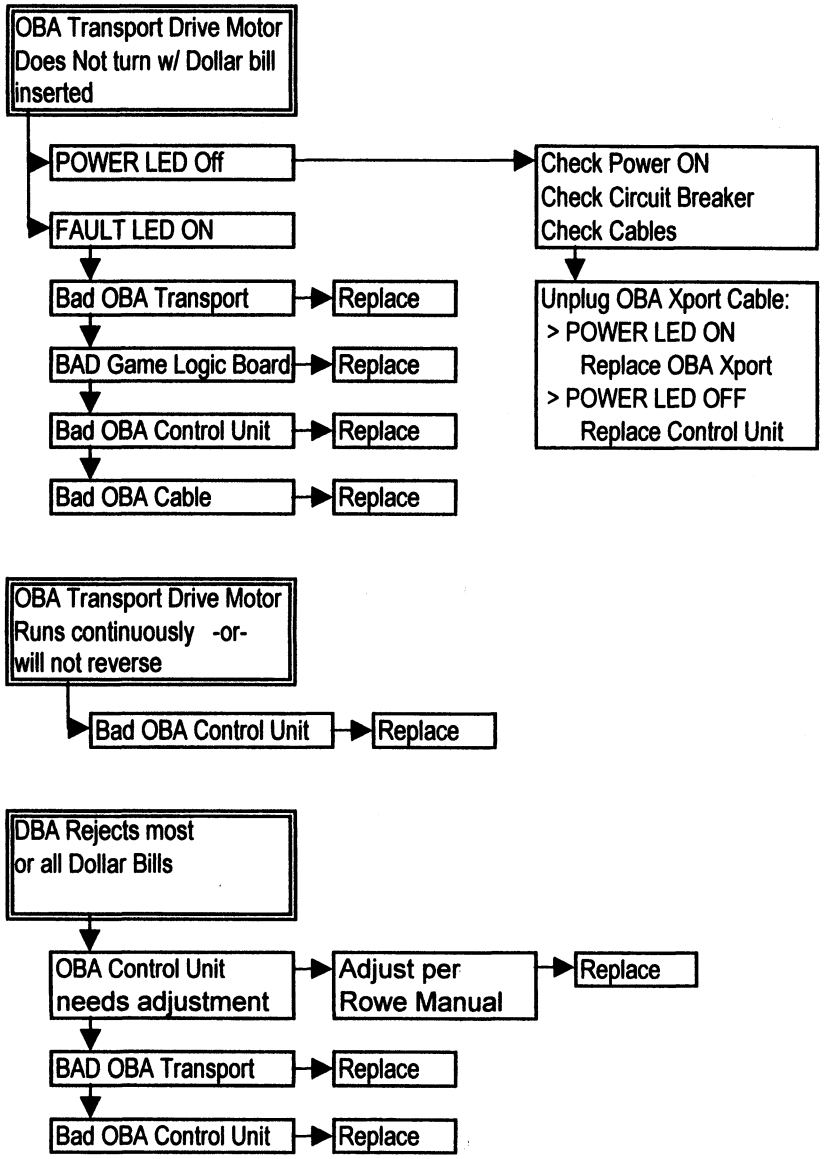


FUNCTION DIP Switch Settings

1	2	3	4	5	6	
I						ON Adds 1 Pulse
	I					ON Adds 2 Pulses
		O				ON Adds 4 Pulses
			O			Credit Pulse Timing: ON=Fast / OFF=Slow
				I		ON Increases Acceptance
					O	ON is Test Mode

Use ON / OFF as marked on chassis
I = ON / O = OFF

OBA System Troubleshooting Flowcharts



Rowe Bill Acceptor Adjustments

We are experiencing many problems in the field with Rowe Bill Acceptors (BA) not taking bills. The following procedure should be performed on all Rowe Bill Acceptors:

You will need a flashlight and a small flathead screwdriver.

First

Clean the BA Belts by placing a Windex soaked corner of your cloth towel on the belts while the motor is running. The motor will run when you press and hold the white TEST button located on the Bill Acceptor "Brain" (Black Box). You will need to dry the belts in a similar fashion when you are done. Be careful not to get your cloth towel caught up in the gears of the BA. Re-align the BA belts on the rollers when you are done.

Second

With the machine turned OFF, manually run a bill through the BA Transport. You do this by manually turning the large white gear located on the right side of the BA Transport. The bill should travel all the way through the Transport as you do this. As the bill leaves the Transport, you will hear the "click" that the spring-loaded return switch makes. Look to make sure that this switch has sprung into the "out" position.

Third

Check the position of the DIP Switches located on the Black Box. They should be in the following position:

1	2	3	4	5	6
ON	ON	OFF	ON	ON	OFF

The ON and OFF labels are located on the outside of the box.
If they are in a different configuration, reset them to the proper configuration.
Always turn the machine off and then on to set any adjustments you make.

Fourth

Check the Motor Speed. Begin by placing DIP Switch #6 in the ON position. Press and hold the TEST Button. If the red FAULT LIGHT, located next to the power light on the Black Box, comes on and stays on, the motor speed is out of adjustment. **While the test button is depressed**, turn the MOTOR SPEED adjustment screw, located on the Black Box, with your flathead screwdriver. When the FAULT LIGHT goes off you have found the correct motor speed. Place DIP Switch #6 back to the OFF position and turn the machine off and on to set your adjustment.

Fifth

With a tiny flathead screwdriver, turn the MAG GAIN adjustment screw, located on the Black Box, all the way up to the maximum position. If the FAULT LIGHT comes on while the test button is depressed, then back off the screw $1/8^{th}$ of a turn.

Rainbow Crane CM24 3

24" Fun Shoppe

Code	*RBC CM 24 Fun*
1	RAM Error
2	Bridge Home Error
3	Claw Home Fail
4	Left Limit Open
5	Forward Limit open
6	Left / Right Limit Closed
7	
8	Front / Rear Limit Closed
9	Claw-Up Limit Closed
10	
11	Claw-Up Limit Open
12	
13	
14	Game Counter
15	Prize Detector Error
16	Claw Tension Fail @ PowerUp
17	Left Joystick Error
18	Rear Joystick Error
19	Right Joystick Error
20	Fwrd Joystick Error
21	
22	Claw Drop Switch Error
24	
33	
44	
55	
66	
69	
88	
98	CPU Interrupt
99	

TROUBLESHOOTING GUIDE for Rainbow CM24 (FUN and 24" Beanie) series

Symptom	Possible Solutions
No power or lights	* Power cord connected. * Check power source.
SEE CAUTION PAGE >	* Check MAIN fuse (next to on/off switch).
SEE CAUTION PAGE >	* Check main power switch connections.
Lights come on but the machine does not initialize	* Check DIP Switch settings. * Check fuse on logic board. * Check connectors and wiring on the carriage and transport system. * Check or replace main logic board. * Are error codes showing on the Display? See ERROR CODES.
Claw chatter at transport home (up) position	* Check for intermittent flapper switch connections and operation. * Check claw solenoid coil cable for break. * Check claw motor brake.
Claw drops intermittently	* Check continuity of coiled claw cable. * Test flapper switch.
Carriage/Transport moves as soon as money is placed in the machine	* Check Joystick switches. * Check connections and wiring. * Replace the logic board.
Carriage/Transport does not respond properly to the joystick	* Same as above. * Check drive motors. * Check for proper dip switch settings and correct version EPROM.
Intermittent Carriage operation or travel	* Check cabinet to carriage swing harness connectors and cable continuity. * Check Joystick switches.
SEE CAUTION PAGE >	* Check for loose fuse holder on main logic board. * Replace the logic board.
No credits are given when Coins or Dollars are placed in the machine	* Check alignment of the trip wire located at the bottom of the coin chute on the coin acceptor. * Check DBA (if equipped). * Replace the logic board.
DBA (if equipped) not accepting money	* See Rowe data section * Replace DBA
Carriage/Transport motors do not stop at Home position.	* Check alignment of "home" limit switches. * Test all switches using maintenance mode operation. * Align carriage support shafts & wheels (binding). * Replace the logic board.
Carriage/Transport can't get Home, motors still run.	* Clean Carriage and Transport rails. * Replace transport / carriage drive belts. * Check drive wheel setscrews are tight. * Align carriage support shafts & wheels (binding).

Intermittent crane operation. SEE CAUTION PAGE > SEE CAUTION PAGE > SEE CAUTION PAGE >	* Test all switches using maintenance mode operation. * Check that all cable ends are securely seated. * Check MAIN fuse (next to on/off switch). * Check fuse holder on the main logic PCB holder must hold fuse snugly. * Check that the crane is properly grounded at the power source. * Replace main logic PCB.
Claw string unwinds	* Check string motor brake. * Check swing arm inside transport is not rubbing anything. * Check for misaligned or bent parts associated with the swing arm.. * Check anti-tangle switch. * Replace the logic board.
Claw Ho-Ho's up and down	* Check string motor brake. * Check intermittent anti-tangle switch operation. * Check for intermittent solenoid cord. * Replace the logic board.
String tangle	* Replace worn string.
Claw motor will not hold claw against flapper switch	* Check if brake release is activated i.e., pushed in or obstructed. * Check anti-tangle switch alignment & function. * Replace transport. * Do not pull claw down manually. This will cause motor and brake damage.
Claw will not close	* Test claw operation using the maintenance mode of operation. * Perform a continuity test on the coil wire connected to the solenoid. * Perform a continuity test of the solenoid. * Replace the logic board.
Inordinately strong claw (24" Beanie only)	* Check compression spring and washer are properly installed in the claw housing. * Check claw voltage; should be between 15 and 19 volts * Replace claw assembly. * Replace the logic board.
Intermittent or broken claw coil cord	* Replace coil cord immediately. * Check claw voltage; the Logic board may fail due to a worn coil cord.
Intermittent LED display operation	* Check 5-volt output from power supply, replace if not between 4.9 and 5.2 V. * Check flat cable to LED for pinches, usually at the door hinge. * Check ribbon cable on the main PCB is connected properly, key on plug fits into key slot of connector on the PCB. * Replace LED. * Replace the logic board.
Game counter does not work but machine accepts Money and games are shown on the LED	* Ensure proper connection is made to the main PCB. * Replace game counter. * Replace main logic board.

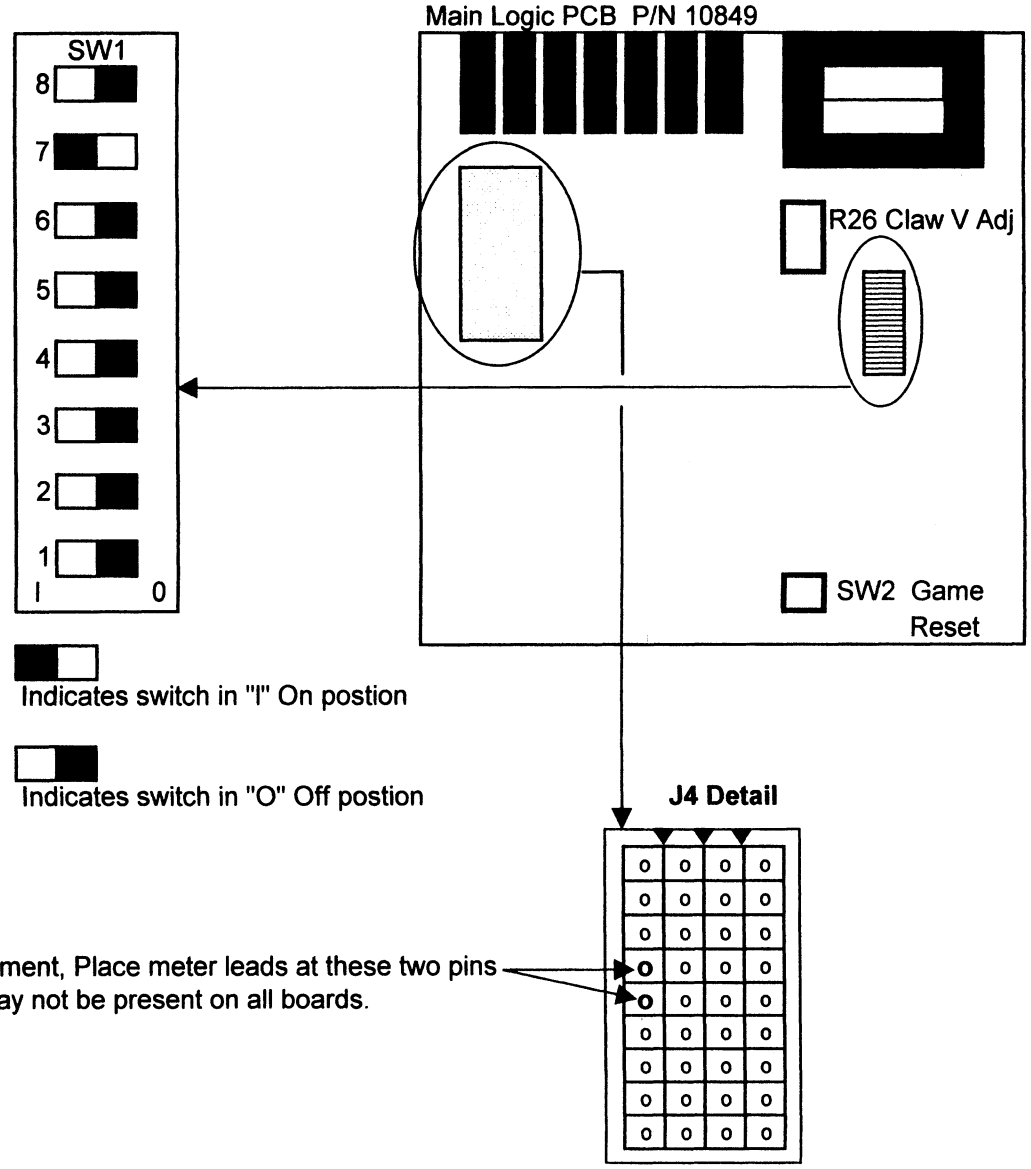
Free games being given	* Close the cabinet door tightly and repeatedly 'thump' coin mech. plate, Check if credits accumulate; check alignment of coin mech. switches. * Replace DBA (if equipped).. * Replace the logic board.

Main 5 amp power fuse continually blows ***SEE CAUTION PAGE***	* Check power outlet is 120V AC. * Check main power switch and fuse holder are not shorted. * Check to ensure all AC connectors in the machine are secure (three pronged connectors with white, black and green wires) * Remove all AC power connections in the machine. * Replace the blown 5 amp fuse with a new one: * Replace AC connectors one at a time. - AC to power supply. - AC to main PCB. - AC to dollar acceptor. - AC to florescent toy area lights. * The short is in the last circuit which caused the 5 amp fuse to blow. * Repair or replace the defective cable, connector or component.

Switch 1	1	2	3	4	5	6	7	8
Software Release Date	O							
Burn-In Mode		O						
Maintenance Mode			O					
Factory Setting				O				
Prize Detector Disable					O			
Prize Detector Enable					I			
Joystick Game						O		
Pushbutton Game						I		
0.25 Play							O	
0.50 Play							I	
15 Seconds Time								O
30 Seconds Time								I

15 Second / 0.25 Play	O	O	O	O	O	O	O	O
w/ Play Till You Win	O	O	O	O	I	O	O	O
15 Second / 0.50 Play	O	O	O	O	O	O	I	O

Note: SW1 #5 may be ON or OFF on games equipped with a prize detector. It MUST be OFF on games without prize detector.



RBC CM24 (Fun and 24" Beanie) MAINTENANCE MODE OPERATION

Dip Switch #3 "ON"

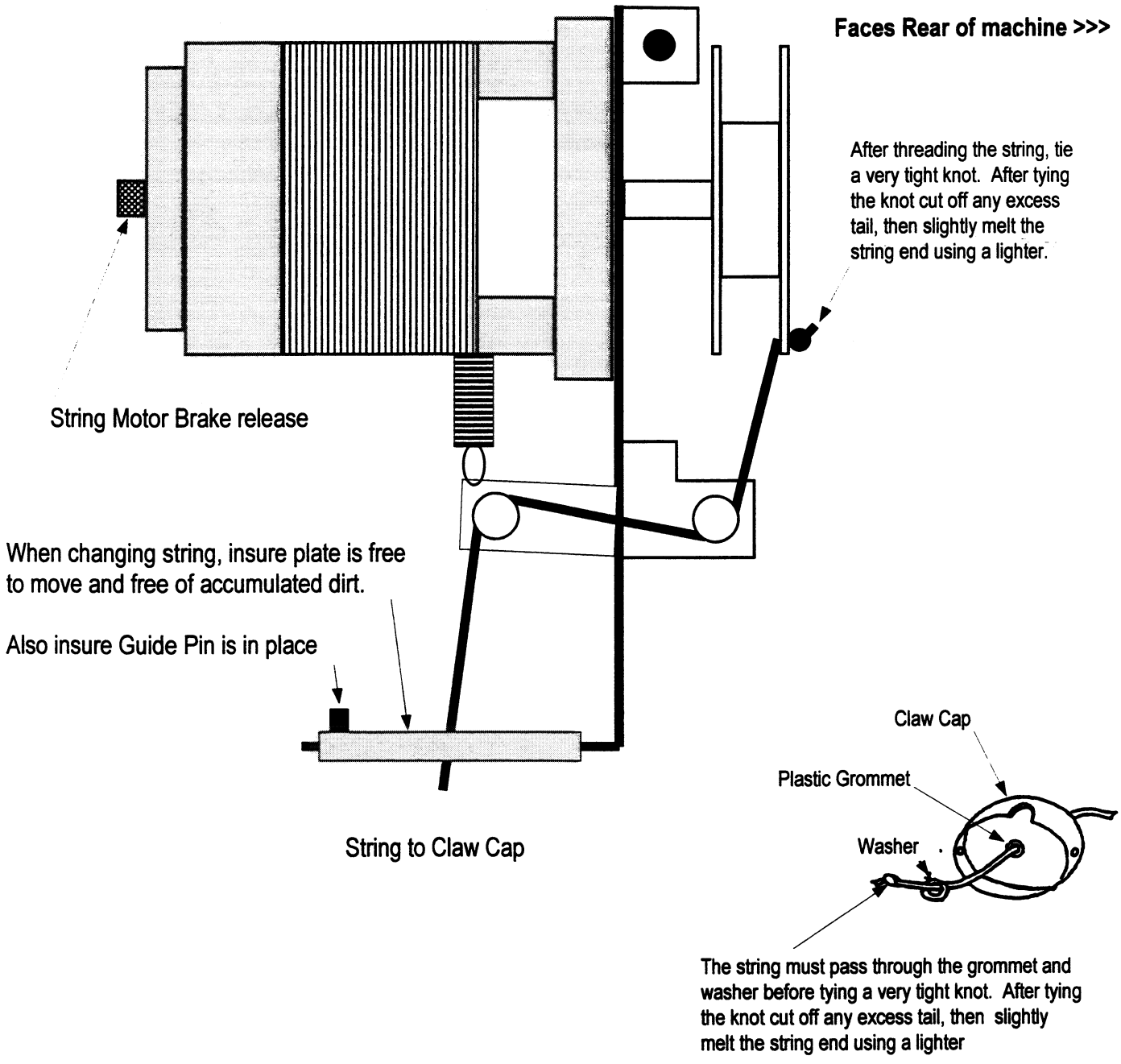
The game / timer display on the Joystick / Push Button Control Housing is used to display codes associated with machine micro-switch operability. The upper portion of the display is used to indicate condition of the joystick or push button micro-switches (good / bad).

Joystick Position	Code When Switch is Good
FORWARD	0.8
REAR	0.4
LEFT	0.1
RIGHT (Claw Close Test)	0.2
NEUTRAL	0.0

The lower portion of the game/timer display is used to indicate operational condition of micro-switches on the Transport and Carriage Assemblies.

Switch	Code When Switch is Good
TRANSPORT	
Flapper	2.0
Anti-Tangle	1.0
CARRIAGE	
Left	0.1
Right	0.1
Rear	0.4
Front	0.4

* To move the claw UP or DOWN hold the Joystick to the right During Power-up.. Hold the Joystick in the 'Forward position to run the claw Down. Hold the Joystick in the Right position to run the claw Up. An 8.8 will appear on the lower portion of the LED when the machine has been actively placed in the claw move mode.



Rainbow CM24 (Fun and 24" Beanie) Transport Claw String Routing

TECHNICAL BULLETIN

CONTRARY TO POPULAR BELIEF, MOTORS DO NOT RUN ON ELECTRICITY.

MOTORS RUN ON PRE-INSTALLED SMOKE, ELECTRICITY IS WHAT KEEPS THE SMOKE IN.

IF THE SMOKE GETS OUT THEN THE MOTOR IS NO GOOD ANY MORE.

Rainbow Crane Classic 4

42" Toy Shoppe

60" Toy Shoppe

Code	*RBC Classic*
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
24	
33	Bridge Home Fail in Game
44	Claw Home Fail
55	EPROM Fail
66	Bridge Home Fail @ StartUp
69	
88	Eqpt in Maintenance Mode
98	Eqpt in Life Cycle Mode
99	

TROUBLESHOOTING GUIDE for Rainbow "Classic" series

Symptom	Possible Solutions
No power or lights	* Power cord connected. * Check power source.
SEE CAUTION PAGE >	* Check MAIN fuse (next to on/off switch).
SEE CAUTION PAGE >	* Check main power switch connections.
Lights come on but the machine does not initialize	* Check DIP Switch settings. * Check fuse on logic board. * Check connectors and wiring on the carriage and transport system. * Check or replace main logic board. * Are error codes 33 or 44 showing on the LED? See ERROR CODES.
Claw chatter at transport home (up) position	* Check for intermittent flapper switch connections and operation. * Check claw solenoid coil cable for break. * Check claw motor brake.
Claw tilts too far	* Check adjustment at top of transport. * Check pivot screw and alignment of the rocker arm located inside the transport which is used as a guide for the claw string.
Claw drops intermittently	* Check continuity of coiled claw cable. * Test flapper switch.
Carriage/Transport moves as soon as money is placed in the machine	* Check joystick / push button switches. * Check connections and wiring. * Replace the logic board.
Carriage/Transport does not respond properly to the joystick/push button	* Same as above. * Check drive motors. * Check for proper dip switch settings and correct version EPROM.
Intermittent Carriage operation or travel	* Check cabinet to carriage swing harness connectors and cable continuity. * Check joystick / push button switches.
SEE CAUTION PAGE >	* Check for loose fuse holder on main logic board. * Replace the logic board.
No credits are given when Coins or Dollars are placed in the machine	* Check alignment of the trip wire located at the bottom of the coin chute on the coin acceptor. * Check DBA * Replace the logic board.
DBA not accepting money	* See Rowe or Mars data section * Replace DBA transport. * Mars AE series DBA's; check programming coupon settings and dip switches.
Carriage/Transport motors do not stop at Home position. Error code 66 or 33.	* Check alignment of "home" limit switches. * Test all switches using maintenance mode operation. * Align carriage support shafts & wheels (binding). * Replace the logic board.

Carriage/Transport can't get Home, motors still run. Error code 66 or 33.	* Clean Carriage and Transport rails. * Replace transport / carriage drive belts. * Align carriage support shafts & wheels (binding).

Intermittent crane operation. SEE CAUTION PAGE > SEE CAUTION PAGE > SEE CAUTION PAGE >	* Test all switches using maintenance mode operation. * Check that all cable ends are securely seated. * Check MAIN fuse (next to on/off switch). * Check fuse holder on the main logic PCB holder must hold fuse snugly. * Check that the crane is properly grounded at the power source. * Replace main logic PCB. * Replace running lights or sequencer PCB if one or both strips are not operational on single power supply versions.

Claw string unwinds	* Check string motor brake. * Check swing arm spring inside transport is not rubbing anything. * Check for misaligned or bent parts associated with the swing arm.. * Check anti-tangle switch. * Replace the logic board.

Claw Ho-Ho's up and down	* Check string motor brake. * Check intermittent anti-tangle switch operation. * Check for intermittent solenoid cord. * Replace the logic board.

String tangle	* Open flapper, access to the tangled string is obvious. * Replace worn string.

Claw motor will not hold claw against flapper switch	* Check if brake release is activated i.e., pushed in or obstructed. * Check anti-tangle switch alignment & function. * Replace transport. * Do not pull claw down manually. This will cause motor and brake damage.

Claw will not close	* Test claw operation using the maintenance mode of operation. * Perform a continuity test on the coil wire connected to the solenoid. * Perform a continuity test of the solenoid. * Replace the logic board.

Inordinately strong claw	* Check compression spring and washer are properly installed in the claw housing. * Check claw voltage; should be between 15 and 19 volts * Replace claw assembly. * Replace the logic board.

Intermittent or broken claw coil cord	* Replace coil cord immediately. * Check claw voltage; the Logic board may fail due to a worn coil cord.

ERROR CODE 66 or 33	* After the machine attempted to move the carriage and transport to the home position six times the machine failed.

ERROR CODE 44	* After the machine attempted to move the claw to the home position six times the machine failed.

Intermittent LED display operation	* Check 5-volt output from power supply, replace if not between 4.9 and 5.2 V. * Check flat cable to LED for pinches, usually at the door hinge. * Check ribbon cable on the main PCB is connected properly, key on plug fits into key slot of connector on the PCB. * Replace LED. * Replace the logic board.

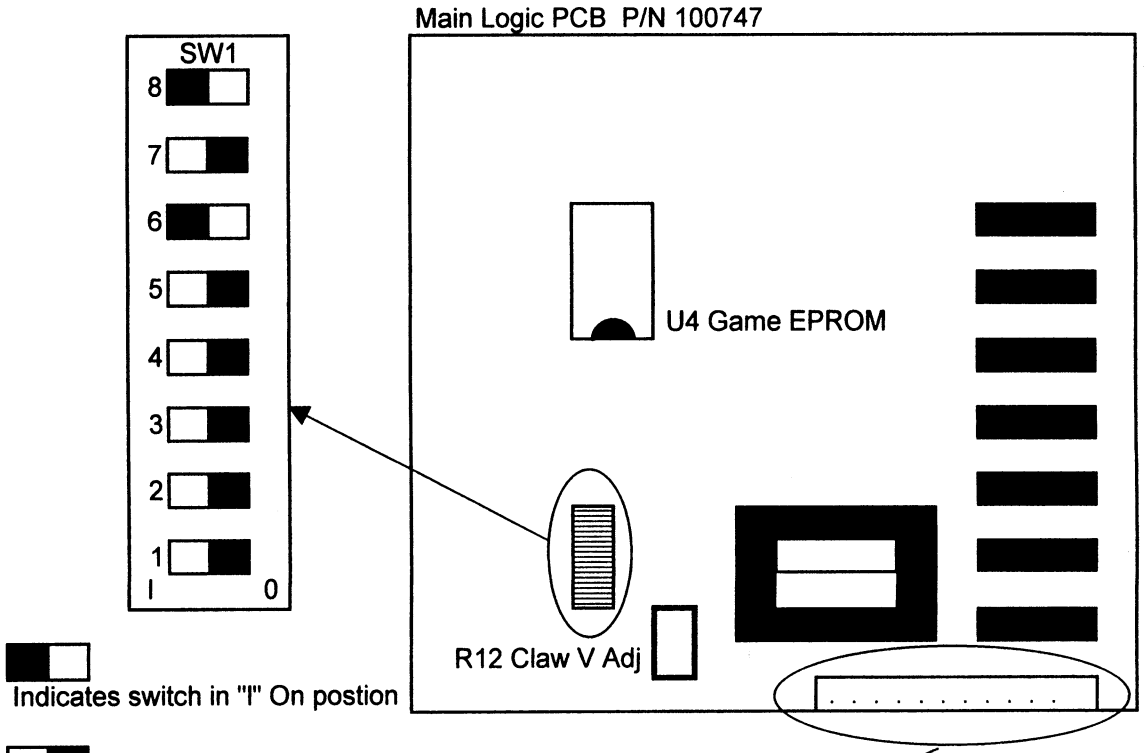
Game counter does not work but machine accepts Money and games are shown on the LED	* Check door switch. * Ensure proper connection is made to the main PCB. * Replace game counter. * Replace main logic board.

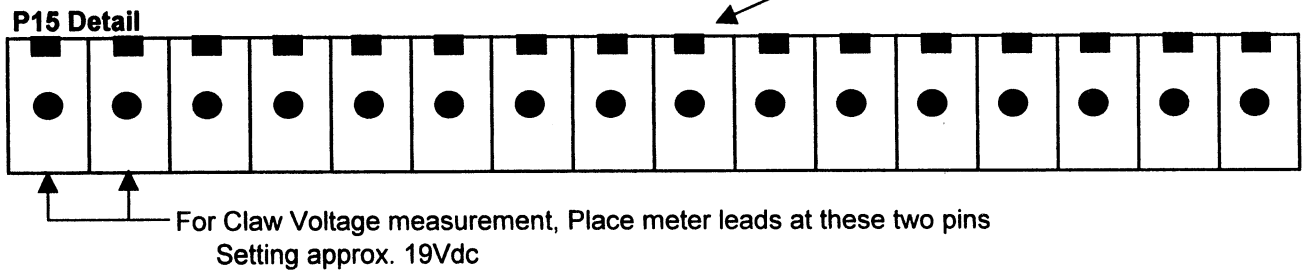
Free games being given	* Close the cabinet door tightly and repeatedly 'thump' coin mech. plate, Check if credits accumulate; check alignment of coin mech. switches. * Replace DBA. * Replace the logic board.

Main 5 amp power fuse continually blows ***SEE CAUTION PAGE***	* Check power outlet is 120V AC. * Check main power switch and fuse holder are not shorted. * Check to ensure all AC connectors in the machine are secure (three pronged connectors with white, black and green wires) * Remove all AC power connections in the machine. * Replace the blown 5 amp fuse with a new one: * Replace AC connectors one at a time. - AC to power supply. - AC to main PCB. - AC to dollar acceptor. - AC to florescent toy area lights. * The short is in the last circuit which caused the 5 amp fuse to blow. * Repair or replace the defective cable, connector or component.

Switch 1	1	2	3	4	5	6	7	8
Burn-In Mode	O							
Maintenance Mode		O						
Factory Setting			O					
Factory Setting				O				
1.00 Play					I	I		
0.75 Play					I	O		
0.50 Play					O	I		
0.25 Play					O	O		
45 Seconds Time							I	I
30 Seconds Time							I	O
20 Seconds Time							O	I
15 Seconds Time							O	O

15 Second / 0.50 Play	O	O	O	O	O	I	O	O
Limit Switch Test	O	I	O	O	O	I	O	O
20 Second / 0.50 Play	O	O	O	O	O	I	O	I
Limit Switch Test	O	I	O	O	O	I	O	I





RBC Old DIP's

MAINTENANCE MODE OPERATION

Dip Switch #2 "ON"

The game/timer display on the Joystick/Push Button Control Housing is used to display codes associated with machine micro-switch operability. The upper portion of the display is used to indicate condition of the joystick or push button micro-switches(good/bad).

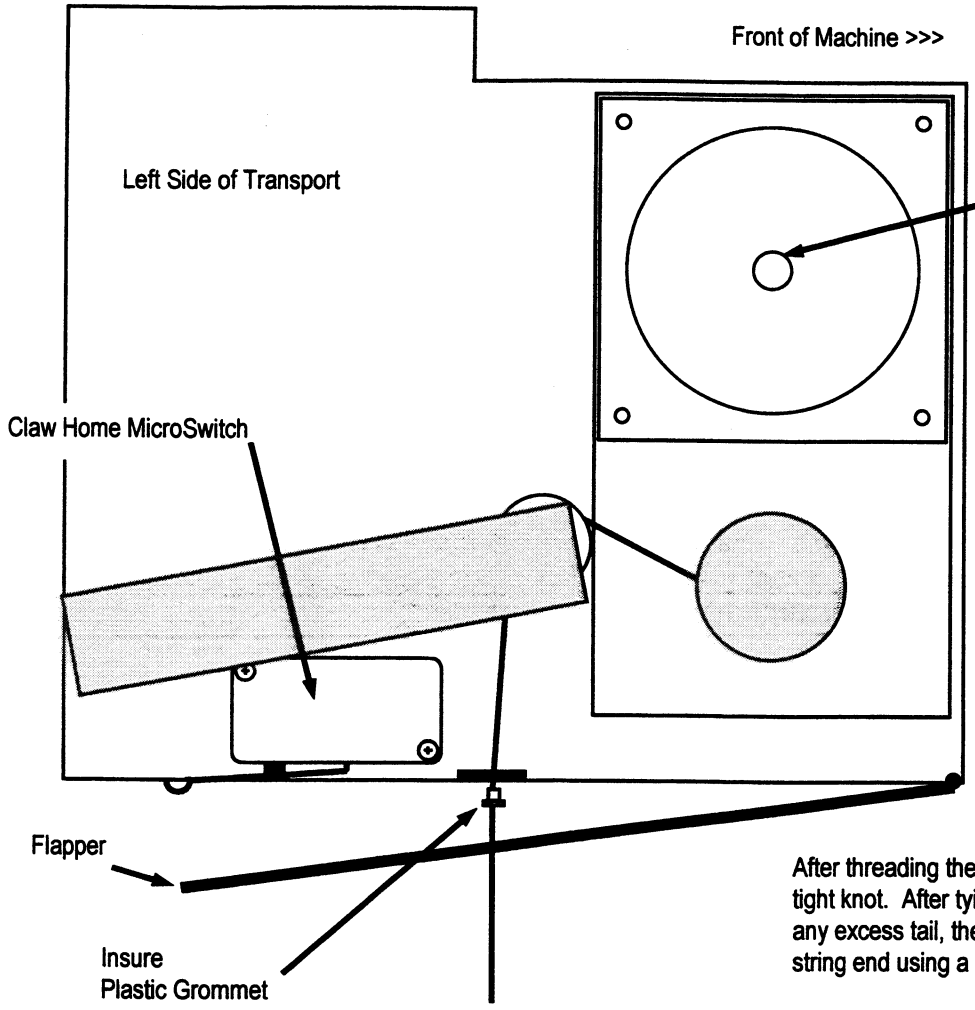
Stick/Button Position	Code When Switch is Good
FORWARD	0.8
REAR	0.4
LEFT	0.1
RIGHT (Claw Close Test)	0.2
NEUTRAL 0.0	

The lower portion of the game/timer display is used to indicate operational condition of micro-switches on the Transport and Carriage Assemblies.

Switch	Code When Switch is Good
TRANSPORT	
Flapper	2.0
Anti-Tangle	1.0
CARRIAGE	
Left	0.1
Right	0.2
Rear	0.8
Front	0.4

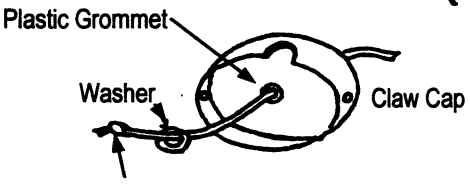
All micro-switches at the "home" position are good/operational when the code 2.5 is indicated on the display. That is, all micro-switches which will be closed when the Carriage and Transport are in the home position are operating properly (Flapper-2.0 / Carriage Left-O.I / Carriage Front-0.4). Add the "home" position codes indicated above for a total of 2.5.

* To move the claw UP or DOWN hold the PB/JS to the right During Power-up.. Hold the PB/JS in the 'Forward position to run the claw Down. Hold the PB/JS in the Right position to run the claw Up. An 8.8 will appear on the lower portion of the LED when the machine has been actively placed in the claw move mode.

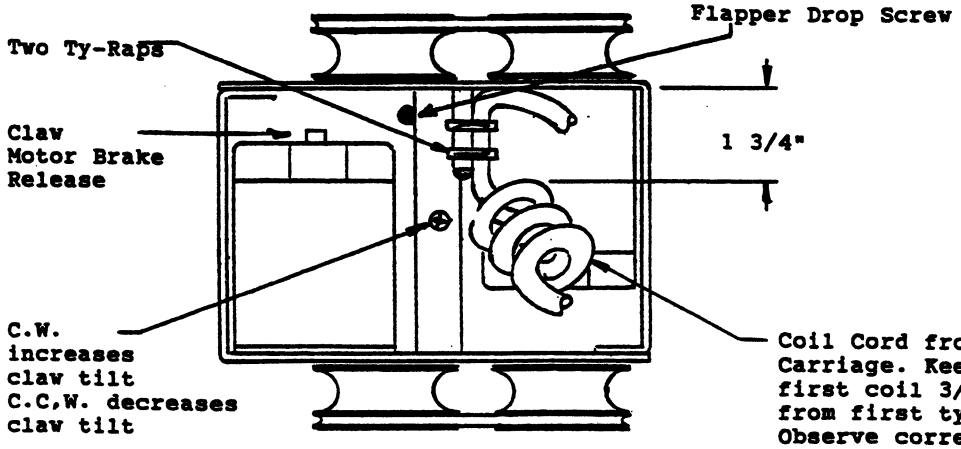


Use a needle to help push the string end through the string motor spool as shown

After threading the string, tie a very tight knot. After tying the knot cut off any excess tail, then slightly melt the string end using a lighter

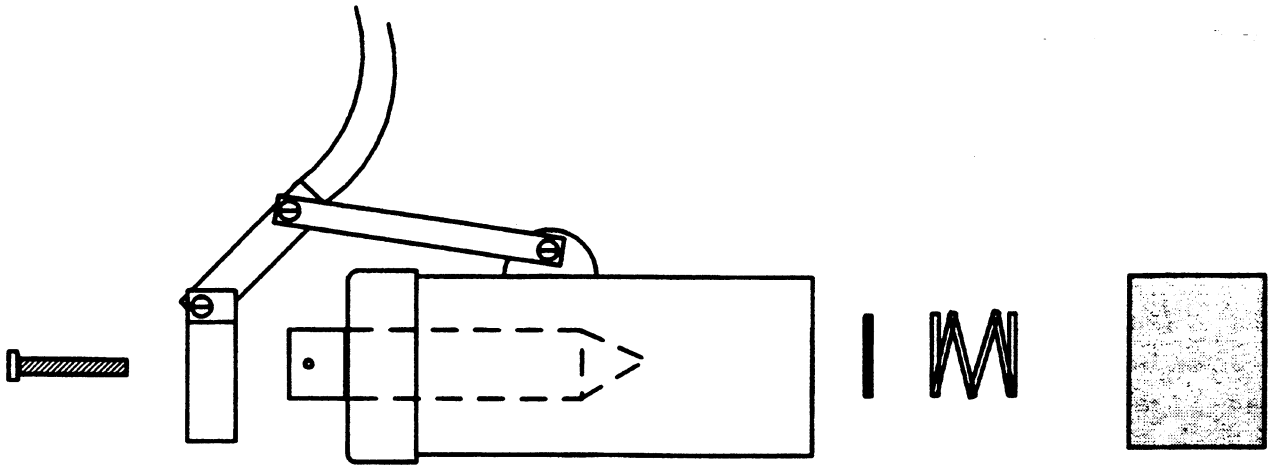


The string must pass through the grommet and washer before tying a very tight knot. After tying the knot cut off any excess tail, then slightly melt the string end using a lighter



TOP VIEW

Rainbow Classic Claw String Routing



Rainbow Claw (exploded diagram)

Rainbow Crane NC/WC 5

CM30 30" Fun Shoppe

NC30 30" Beanie Shop

NC42 42" Toy Shoppe

NC60 60" Toy Shoppe

WC42 Treasure Shoppe

Code	*RBC CM30 / NC / WC*
1	RAM Error
2	
3	Claw Home Fail
4	Carrige Home Fail
5	Xport Home Fail
6	Left Limit Jam
7	Right Limit Jam
8	Fwrd Limit Jam
9	Rear Limit Jam
10	Claw Up Limit Jam
11	Claw Tension Limit Jam
12	Right Limit Open
13	Rear Limit Open
14	Game Counter
15	
16	Prize Detector Error
17	Left Joystick Error
18	Fwrd Joystick Error
19	Right Joystick Error
20	Rear Joystick Error
21	JS Claw Close Error
22	Claw Drop Switch Error
24	CPU Interrupt
33	
44	
55	
66	
69	
88	
98	
99	Check DIP Switches

TROUBLESHOOTING GUIDE for Rainbow CM30, NC and WC series

Symptom	Possible Solutions
No power or lights	* Power cord connected. * Check power source.
SEE CAUTION PAGE >	* Check MAIN fuse (next to on/off switch).
SEE CAUTION PAGE >	* Check main power switch connections.
Lights come on but the machine does not initialize	* Check POWER Switch is on * Check DIP Switch settings * Check fuse on logic board. * Check connectors and wiring on the carriage and transport system. * Check or replace main logic board. * Are error codes showing on the LED? See ERROR CODES.
Claw chatter at transport home (up) position	* Check for intermittent flapper switch connections and operation. * Check claw solenoid coil cable for break. * Check claw motor brake.
Claw drops intermittently	* Check continuity of coiled claw cable. * Test flapper switch.
Carriage/Transport moves as soon as money is placed in the machine	* Check joystick / push button switches. * Check connections and wiring. * Replace the logic board.
Carriage/Transport does not respond properly to the joystick/push button	* Same as above. * Check drive motors. * Check for proper DIP switch settings and correct version EPROM.
Intermittent Carriage operation or travel	* Check cabinet to carriage swing harness connectors and cable continuity. * Check joystick / push button switches.
SEE CAUTION PAGE >	* Check for loose fuse holder on main logic board. * Replace the logic board.
No credits are given when Coins or Dollars are placed in the machine	* Check alignment of the trip wire located at the bottom of the coin chute on the coin acceptor. * Check DIP Switch settings * Check DBA * Replace the logic board.
DBA not accepting money	* See Rowe or Mars data section * Replace DBA transport. * Mars AE series DBA's; check programming coupon settings and dip switches.
Carriage/Transport motors do not stop at Home position.	* Check alignment of "home" limit switches. * Test all switches using maintenance mode operation. * Align carriage support shafts & wheels (binding). * Replace the logic board.

Carriage/Transport can't get Home, motors still run.	* Clean Carriage and Transport rails. * Replace transport / carriage drive belts. * Align carriage support shafts & wheels (binding).
Intermittent crane operation. SEE CAUTION PAGE > SEE CAUTION PAGE > SEE CAUTION PAGE >	* Test all switches using maintenance mode operation. * Check that all cable ends are securely seated. * Check MAIN fuse (next to on/off switch). * Check fuse holder on the main logic PCB holder must hold fuse snugly. * Check that the crane is properly grounded at the power source. * Replace main logic PCB.
Claw string unwinds	* Check string motor brake. * Check swing arm spring inside transport is not rubbing anything. * Check for misaligned or bent parts associated with the swing arm.. * Check anti-tangle switch. * Replace the logic board.
Claw Ho-Ho's up and down	* Check string motor brake. * Check intermittent anti-tangle switch operation. * Check for intermittent solenoid cord. * Replace the logic board.
String tangle	* Open flapper, access to the tangled string is obvious. * Replace worn string.
Claw motor will not hold claw against flapper switch	* Check if brake release is activated i.e., pushed in or obstructed. * Check anti-tangle switch alignment & function. * Replace transport. * Do not pull claw down manually. This will cause motor and brake damage.
Claw will not close	* Test claw operation using the maintenance mode of operation. * Perform a continuity test on the coil wire connected to the solenoid. * Perform a continuity test of the solenoid. * Replace the logic board.
Inordinately strong claw	* Check compression spring and washer are properly installed in the claw housing. * Check claw voltage; should be between 15 and 19 volts * Replace claw assembly. * Replace the logic board.
Intermittent or broken claw coil cord	* Replace coil cord immediately. * Check claw voltage; the Logic board may fail due to a worn coil cord.
Intermittent LED display operation	* Check 5-volt output from power supply, replace if not between 4.9 and 5.2 V. * Check flat cable to LED for pinches, usually at the door hinge. * Replace LED. * Replace the logic board.

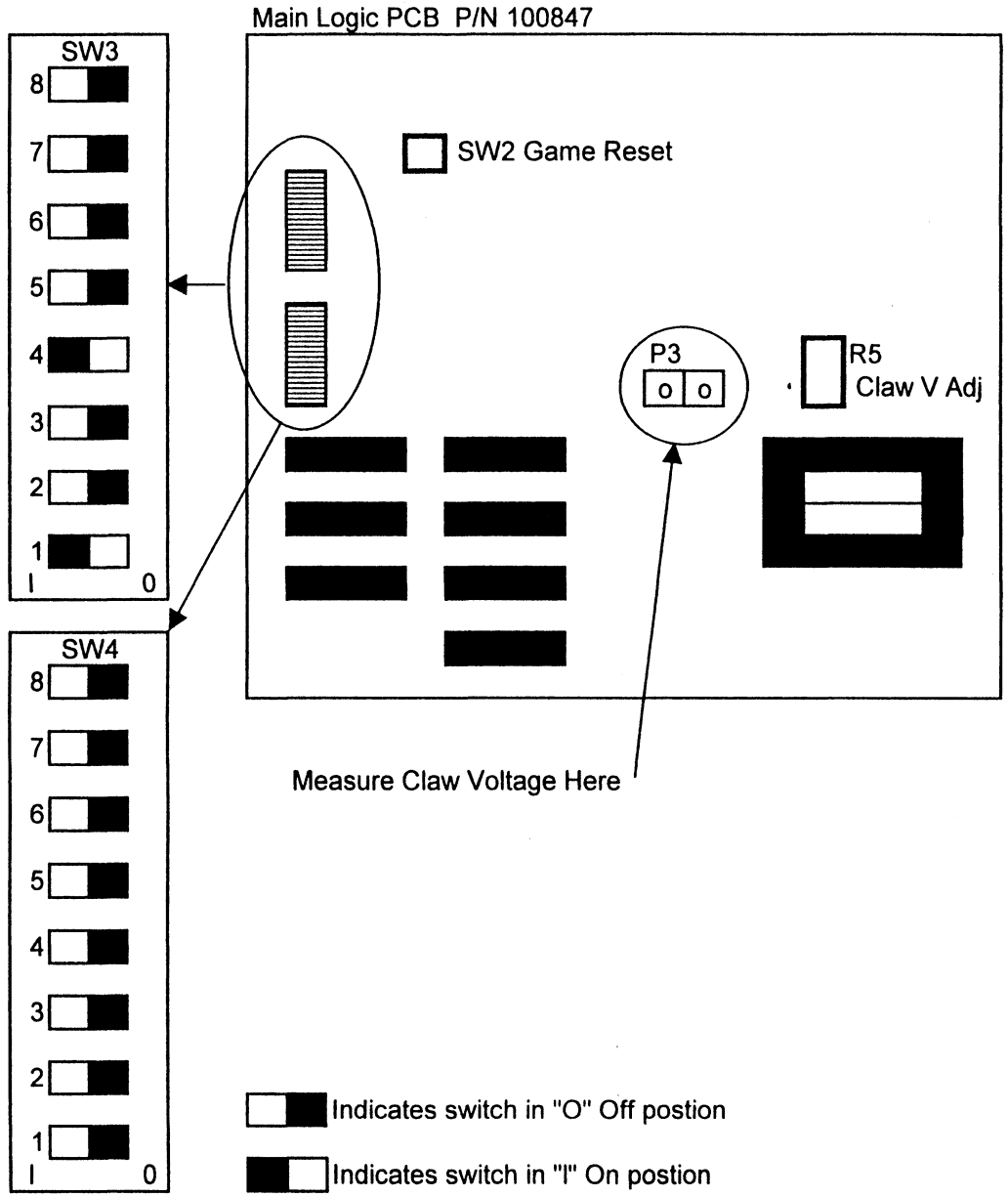
Game counter does not work but machine accepts Money and games are shown on the LED	* Check door switch. * Ensure proper connection is made to the main PCB. * Replace game counter. * Replace main logic board.

Free games being given	* Close the cabinet door tightly and repeatedly 'thump' coin mech. plate, Check if credits accumulate; check alignment of coin mech. switches. * Check DIP Switch settings * Replace DBA. * Replace the logic board.

Main 5 amp power fuse continually blows ***SEE CAUTION PAGE***	* Check power outlet is 120V AC. * Check main power switch and fuse holder are not shorted. * Check to ensure all AC connectors in the machine are secure (three pronged connectors with white, black and green wires) * Remove all AC power connections in the machine. * Replace the blown 5 amp fuse with a new one: * Replace AC connectors one at a time. - AC to power supply. - AC to main PCB. - AC to dollar acceptor. - AC to florescent toy area lights. * The short is in the last circuit which caused the 5 amp fuse to blow. * Repair or replace the defective cable, connector or component.

Switch 3	1	2	3	4	5	6	7	8
15 Seconds Time	O	O						
20 Seconds Time	I	O						
30 Seconds Time	O	I						
45 Seconds Time	I	I						
Free Play			O	O	O			
0.25 Play			O	O	I			
0.50 Play			O	I	O			
0.75 Play			O	I	I			
1.00 Play			I	O	O			
1.25 Play			I	O	I			
1.50 Play			I	I	O			
1.75 Play			I	I	I			
Factory Setting						O		
PTYW O/I							O	
PB Game								I
JS Game								O
Joystick 15 Second / 0.50 Play	O	O	O	I	O	O	O	O
Joystick 20 Second / 0.50 Play	I	O	O	I	O	O	O	O

Switch 4	1	2	3	4	5	6	7	8
Maintenance Mode	O							
Software Release		O						
Life Cycle			O					
Card Dispenser I/O				O				
PTYW Sensor Test					O			
Money Diagnostic						O		
Continuity Test							O	
Diagnostic Test								O
Limit Switch Test	I	O	O	O	O	O	O	I



SW3 / SW4 Example for Joystick Game, 20 Second Time, 0.50 per play

RBC CM30, NC42, NC60 and WC MAINTENANCE MODE OPERATION

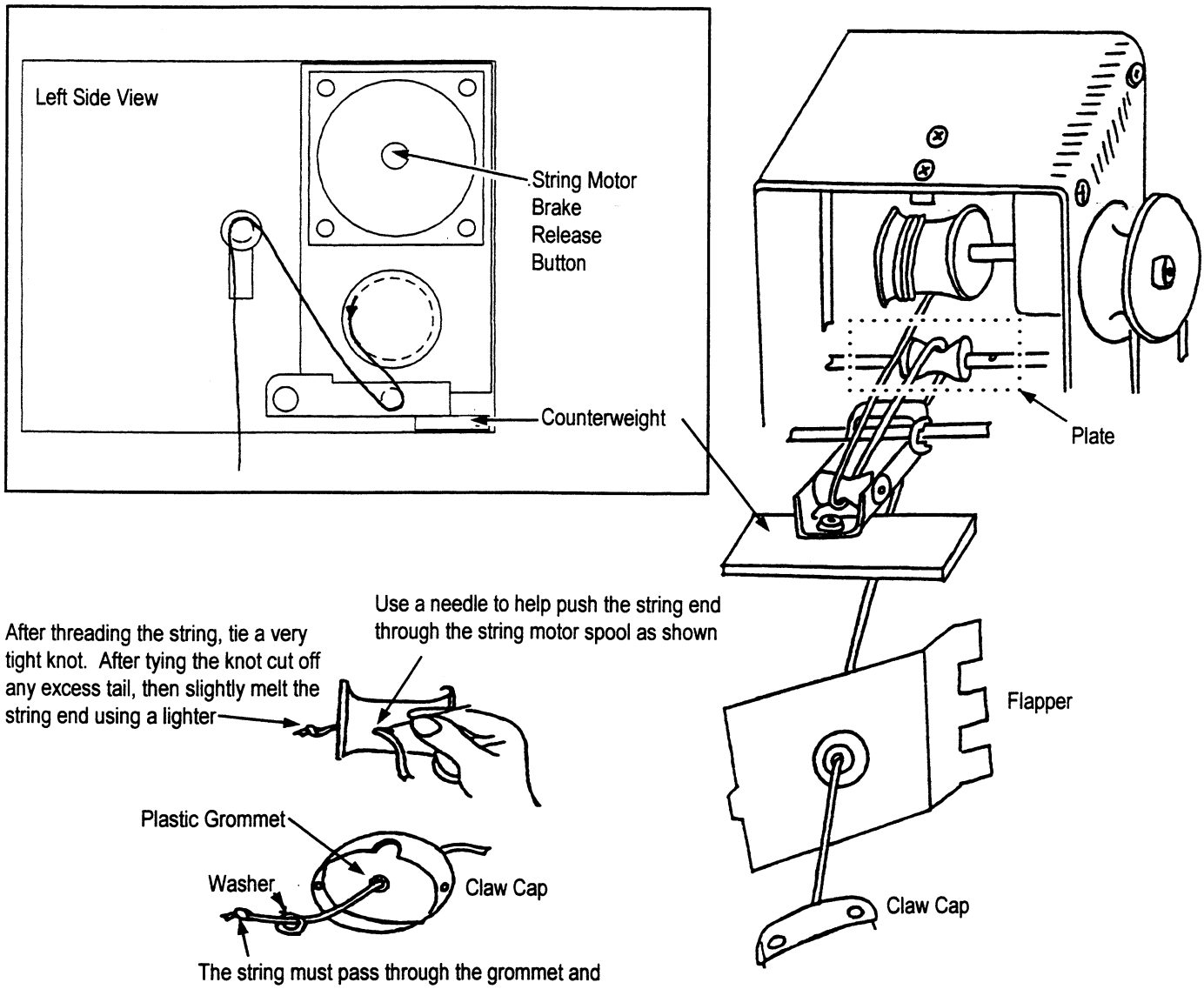
DIP Switch SW4 positions 1 and 8 "ON" / Push SW2 Reset / Front Door open.

The game / timer display on the Joystick / Push Button Control Housing is used to display codes associated with machine micro-switch operability. The upper portion of the display is used to indicate condition of the joystick or push button micro-switches (good / bad).

Stick/Button Position	Code When Switch is Good
NEUTRAL	0 0
LEFT	0 1
RIGHT (Claw Close Test)	0 2
FORWARD	0 4
REAR	0 8
Claw Drop	2 0

The lower portion of the game/timer display is used to indicate operational condition of micro-switches on the Transport and Carriage Assemblies.

Switch	Code When Switch is Good
TRANSPORT	
Flapper	2 0
Anti-Tangle	1 0
CARRIAGE	
Left	0 1
Right	0 2
Front	0 4
Rear	0 8

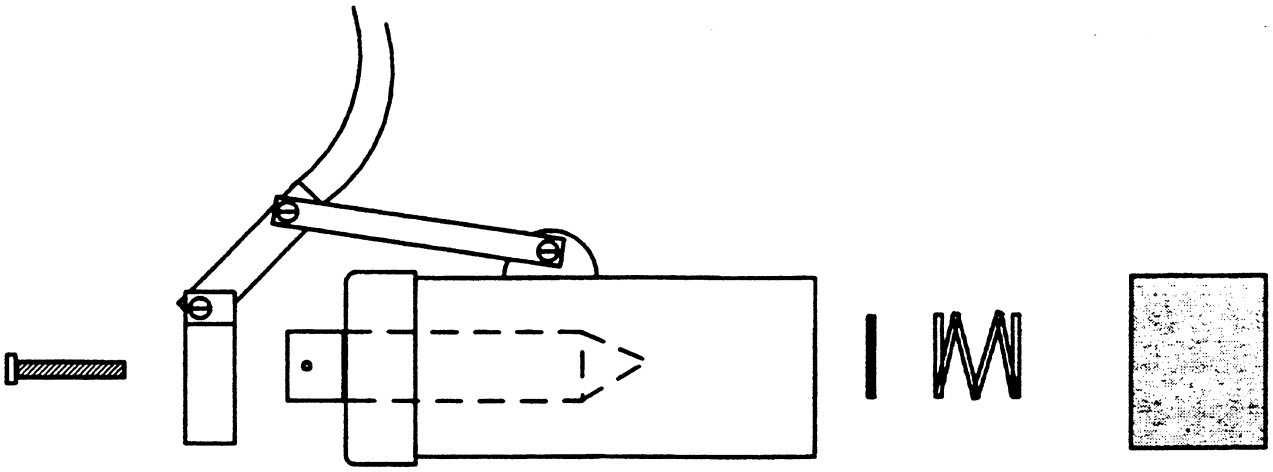


After threading the string, tie a very tight knot. After tying the knot cut off any excess tail, then slightly melt the string end using a lighter

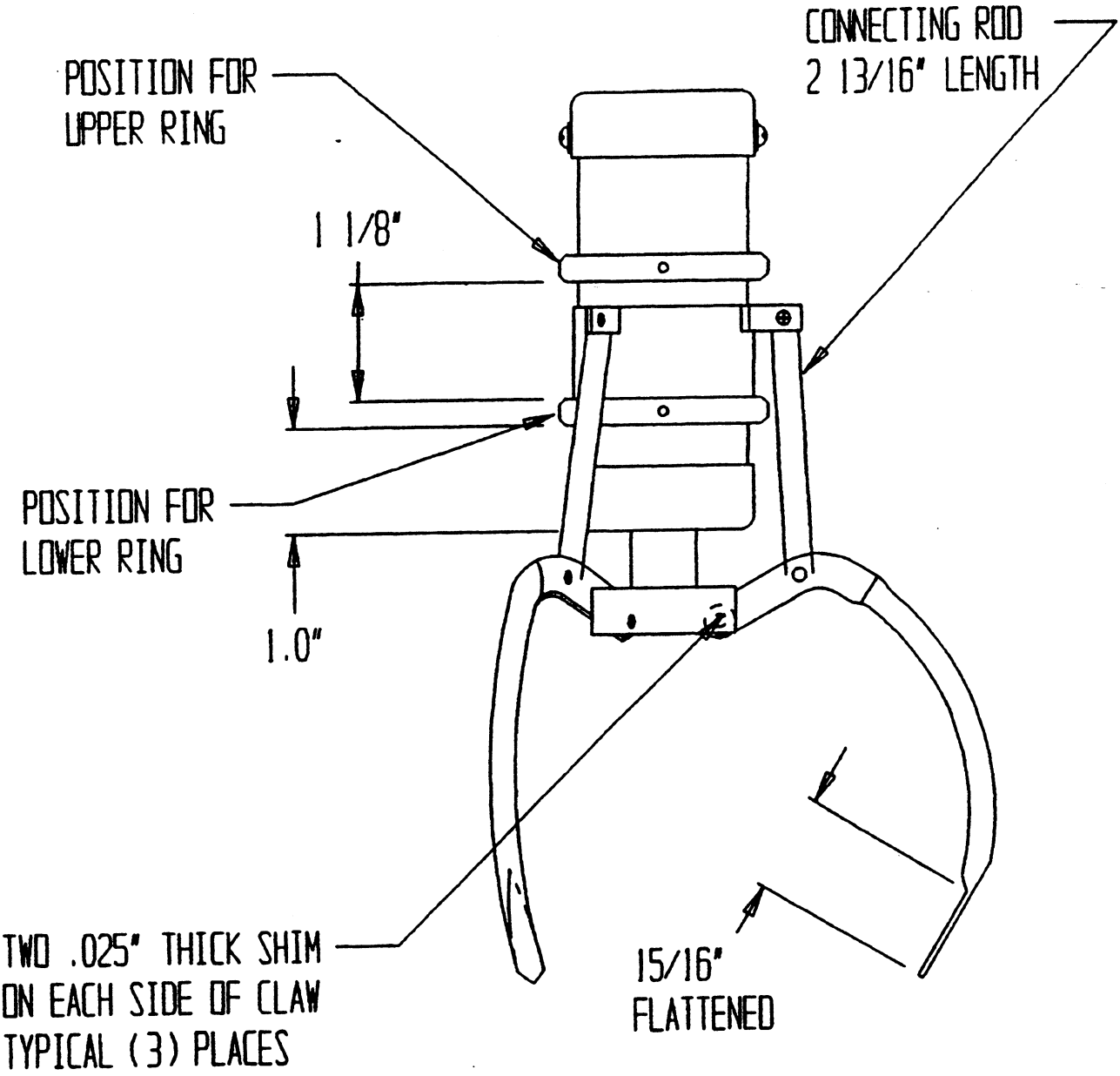
Use a needle to help push the string end through the string motor spool as shown

The string must pass through the grommet and washer before tying a very tight knot. After tying the knot cut off any excess tail, then slightly melt the string end using a lighter

Rainbow CM30, WC42 and NC series Claw String Routing



Rainbow NC Claw (exploded diagram)



CLAW FINGER GAP ADJUSTMENT for Treasure Shoppe Application

1. Energize claw - set machine in Maintenance Mode
2. Fine adjust Lower Ring for Claw Fingertip overlap of 3/8"
3. Fine adjust Upper Ring for Claw Fingertip gap of 1 1/4"
4. Insure Sleeve moves freely up and down over Claw Body.

CLAW FINGER GAP ADJUSTMENT for NC30 Beanie Shoppe Application

1. Energize claw - set machine in Maintenance Mode
2. Adjust Upper and Lower Rings against sleeve for Claw Fingertip gap of 3/16'

Rainbow WC and NC30 Claw

Smart 6

6th Generation Mechanicals

CSTS60 60" Toy Shoppe

CS34 34" Toy Shoppe

CS42 42" Toy Shoppe

Code	*Smart 6th Gen Toy*
1	RAM Error
2	ROM Error
10	Claw / Bridge Home Fail
69	CPU Fail

	Red LED	Yellow LED	Green LED
CPU Failure	ON	ON	ON
EPROM Failure	ON	ON	OFF
Power On Test Failure	ON	OFF	OFF
General Failure	ON		
General Failure		ON	
Normal	OFF	OFF	Flashing

TROUBLESHOOTING GUIDE for Smart CS and CSTS series

Symptom	Possible Solutions
No power or lights	* Power cord connected.
	* Check power source.
SEE CAUTION PAGE >	* Check MAIN fuse (next to on/off switch).
SEE CAUTION PAGE >	* Check main power switch connections.
Lights come on but the machine does not initialize	* Check POWER Switch is on
	* Check DIP Switch settings
	* Check connectors and wiring on the carriage and transport system.
	* Check or replace main logic board.
Intermittent Crane Head operation or travel	* Check cabinet Chain Cable connectors and cable continuity.
	* Check Joystick switches.
	* Replace the logic board.
Wagon/Trolley moves as soon as money is placed in the machine	* Check Joystick switches.
	* Check connections and wiring.
	* Replace the logic board.
Wagon/Trolley does not respond properly to the joystick	* Same as above.
	* Check drive motors.
	* Check for proper DIP switch settings
Wagon/Trolley motors do not stop at Home position.	* Check alignment of "home" limit switches.
	* Test all switches using Test and Service Mode 31.
	* Align carriage support shafts & wheels (binding).
	* Replace the logic board.
Wagon/Trolley can't get Home, motors still run.	* Clean support rails.
	* Align carriage support shafts & wheels (binding).
	* Replace transport / carriage drive belts.
Single Crane Head Motor not moving	* Test all switches using Test and Service Mode 31.
	* Align support rails & wheels (binding).
	* Clean Carriage and Transport rails.
	* Check Motor using Test and Service Mode 28 / 29 / 30
	* Replace the logic board.
All Crane Head Motors not moving	* Check Joystick switches.
	* Check connections and wiring.
	* Logic Board Fuse F1 open
	* Replace the logic board.
	* 48 VAC not present from transformer to board

Intermittent crane operation.	* Test all switches using Test and Service Mode 31. * Check that all cable ends are securely seated. * Check MAIN fuse (next to on/off switch). * Check fuse holder on the main logic PCB holder must hold fuse snugly. * Check that the crane is properly grounded at the power source. * Replace main logic PCB.
Claw does not drop correctly	* Check Motor using Test and Service Mode 30 * Test all switches using Test and Service Mode 31. * Check Down Motor Speed in Game Settings #12 is 10 or greater. * Check Claw String Routing / Replace Claw String * Check brass cable sleeve spring * Check Idler Arm spring or arm for binding * Check 5-volt output from power supply, replace if not between 4.9 and 5.2 V. * Replace the logic board.
Claw string winds up backward	* Test all switches using Test and Service Mode 31. * Check Claw String Routing / Replace Claw String * Check Idler Arm spring or arm for binding * Check brass cable sleeve spring * Check Down Motor Speed in Game Settings #12 is 12 or less.
Claw does not return Home	* Check Motor using Test and Service Mode 30 * Test all switches using Test and Service Mode 31. * Check Claw String Routing / Replace Claw String * Check Up Motor Speed in Game Settings #11 is 19. * Check brass cable sleeve spring * Check Idler Arm spring or arm for binding * Check 5-volt output from power supply, replace if not between 4.9 and 5.2 V. * Replace the logic board.
Claw stays closed	* Check Claw Finger adjustment * Replace the logic board.
Claw will not close	* Test claw operation using Test and Service Mode 26 * Check Claw Finger adjustment * Perform a continuity test on the coil wire connected to the solenoid. * Perform a continuity test of the solenoid. * Replace the logic board.
Inordinately strong claw	* Check Claw Finger adjustment * Check claw voltage; should be between 30 and 36 volts * Replace claw assembly. * Replace the logic board.
Intermittent or broken claw coil cord	* Replace coil cord immediately. * Check claw voltage; the Logic board may fail due to a worn coil cord.
Intermittent LED display operation	* Check 5-volt output from power supply, replace if not between 4.9 and 5.2 V. * Replace LED. * Replace the logic board.

Game counter does not work but machine accepts Money and games are shown on the LED	* Ensure proper connection is made to the main PCB. * Replace game counter. * Replace main logic board.
Free games being given	* Close the cabinet door tightly and repeatedly 'thump' coin mech. plate, Check credits accumulate; check alignment of coin mech. switches. * Check DIP Switch settings * Replace DBA. * Replace the logic board.
No credits are given when Coins or Dollars are placed in the machine	* Check alignment of the trip wire located at the bottom of the coin chute on the coin acceptor. * Check DBA * Replace the logic board.
DBA not accepting money	* Replace DBA transport. * Check programming coupon settings and dip switches.
Main power fuse continually blows ***SEE CAUTION PAGE***	* Check power outlet is 120V AC. * Check main power switch and fuse holder are not shorted. * Check to ensure all AC connectors in the machine are secure (three pronged connectors with white, black and green wires) * Remove all AC power connections in the machine. * Replace the blown fuse with a new one: * Replace AC connectors one at a time. - AC to EMI Filter - AC to power supply. - AC to transformers. - AC to dollar acceptor. - AC to florescent toy area lights. * The short is in the last circuit which caused the 5 amp fuse to blow. * Repair or replace the defective cable, connector or component.

Audit & Test Mode Values

Re-Set @ Power Down (0000-9999)

1	Number of Coins, MSD
2	Number of Coins, LSD
3	Games Played, MSD
4	Games, LSD
5	Games Won, MSD
6	Games Won, LSD
7	Wins per Game %

Operator Resetable (0000-9999)

8	Number of Coins, MSD
9	Number of Coins, LSD
10	Games Played, MSD
11	Games, LSD
12	Games Won, MSD
13	Games Won, LSD
14	Wins per Game %

Non-Resetable (00000-99999)

15	Number of Coins, MSD
16	Number of Coins, Mid
17	Number of Coins, LSD
18	Games Played, MSD
19	Games Played, Mid
20	Games Played, LSD
21	Games Won, MSD
22	Games Won, Mid
23	Games Won, LSD
24	Wins per Game %

Test and Service

25	Reset All Operator Resetable Audits to 0
26	Claw V @Max
27	Claw V @ TrimPot Setting
28	Front - Back Motor Run
29	Left - Right Motor Run
30	Up - Down Motor Run

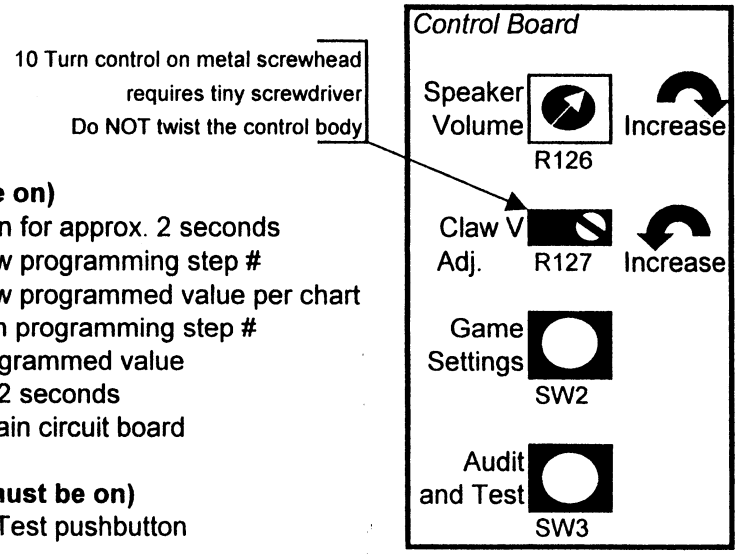
Switch Test

31	1, Down Limit
	2, Up Limit
	3, Forward Limit
	4, Left Limit
	5, JS Left
	6, JS Right
	7, JS Forward
	8, JS Backward
	9, JS Drop
	10, Coin 1
	11, Coin 2
	12, Bill Acceptor
	14, Right Limit
	15, Photo Eyes
	16, Back Limit

Game Settings

#	PreSet	
1	0	Reset To Default (=0)
2	20	Game Timer
3	4	Coin Credit per DBA Credit
4	1	Games per Coin Credit
5	4	Corner Light Speed
6	3	Attract Frequency
7	30	Burn-In Frequency
8	0	AC Output (0: Win Light / 1: Bulk)
9	19	Left - Right Motor Speed
10	19	Front - Back Motor Speed
11	19	Up Motor Speed
12	10	Down Motor Speed
13	0	Coins Reqd to get Bonus Credit
14	0	Bonus Coins
15	1	Coin 1 Multiplier
16	1	Coin 2 Multiplier

Located on the inside left doorframe



Programming GAME SETTINGS (Game Must be on)

1 Press and hold SW2 Game Settings pushbutton for approx. 2 seconds
Upper digits of LED Game Display will show programming step #
Lower digits of LED Game Display will show programmed value per chart
2 Moving the Joystick Up / Down will step through programming step #
Moving the Joystick Left / Right will change programmed value
3 When complete, Press SW2 again for approx. 2 seconds
4 Finish by pressing SW1 Reset button on the Main circuit board

Accessing AUDIT and TEST functions (Game must be on)

1 Follow above procedure using SW3 Audit and Test pushbutton

Switch 4

		8	7	6	5	4	3	2	1	
Coins per Credit	1							O	O	
Coins per Credit	2							O	I	
Coins per Credit	3							I	O	
Coins per Credit	4							I	I	
(Pre-Set Only)					I	I	I			
Game Play Select	B+		O	O						4-Way JS Movement / Single PB Drop
Game Play Select	B		I	O						4-Way JS Movement / Incremental PB Drop
Game Play Select	C		O	I						4-Way JS Movement / Incremental PB Drop
Game Play Select	A+B		I	I						Forward / Right Movement Only
Centering	Off/On	O								Claw plays from Center Field

SW4 B+ Settings O O O I I I O I

Switch 5

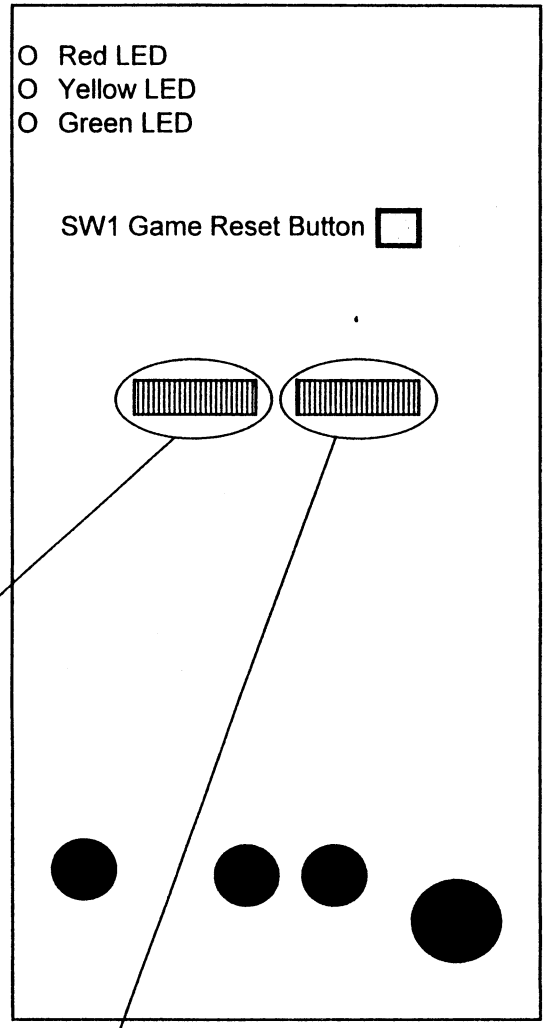
		8	7	6	5	4	3	2	1
Burn-In	Off/On								O
Free Play	Off/On							O	
Attract Sound	Off/On						O		
Attract Mode	Off/On					O			
Eqpd W/ Prize Det	No/Yes				I				
qpd W/O Prize Det	No/Yes				O				
Manual Claw Close	Off/On			O					
(Pre-Set Only)	Off/On		O						
Play 'till you Win	Off/On	O							

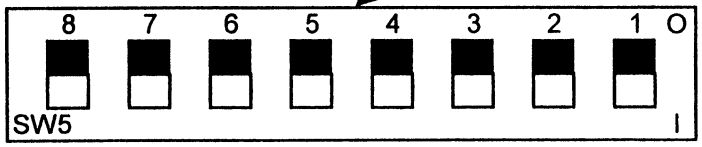
SW5 B+ Settings O O O I O O O O

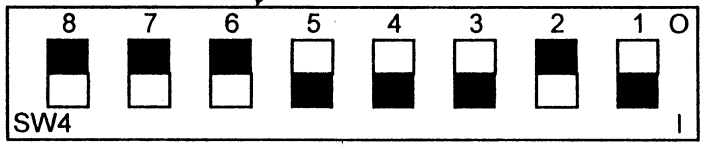
* If Equiped w/ a Prize Detector

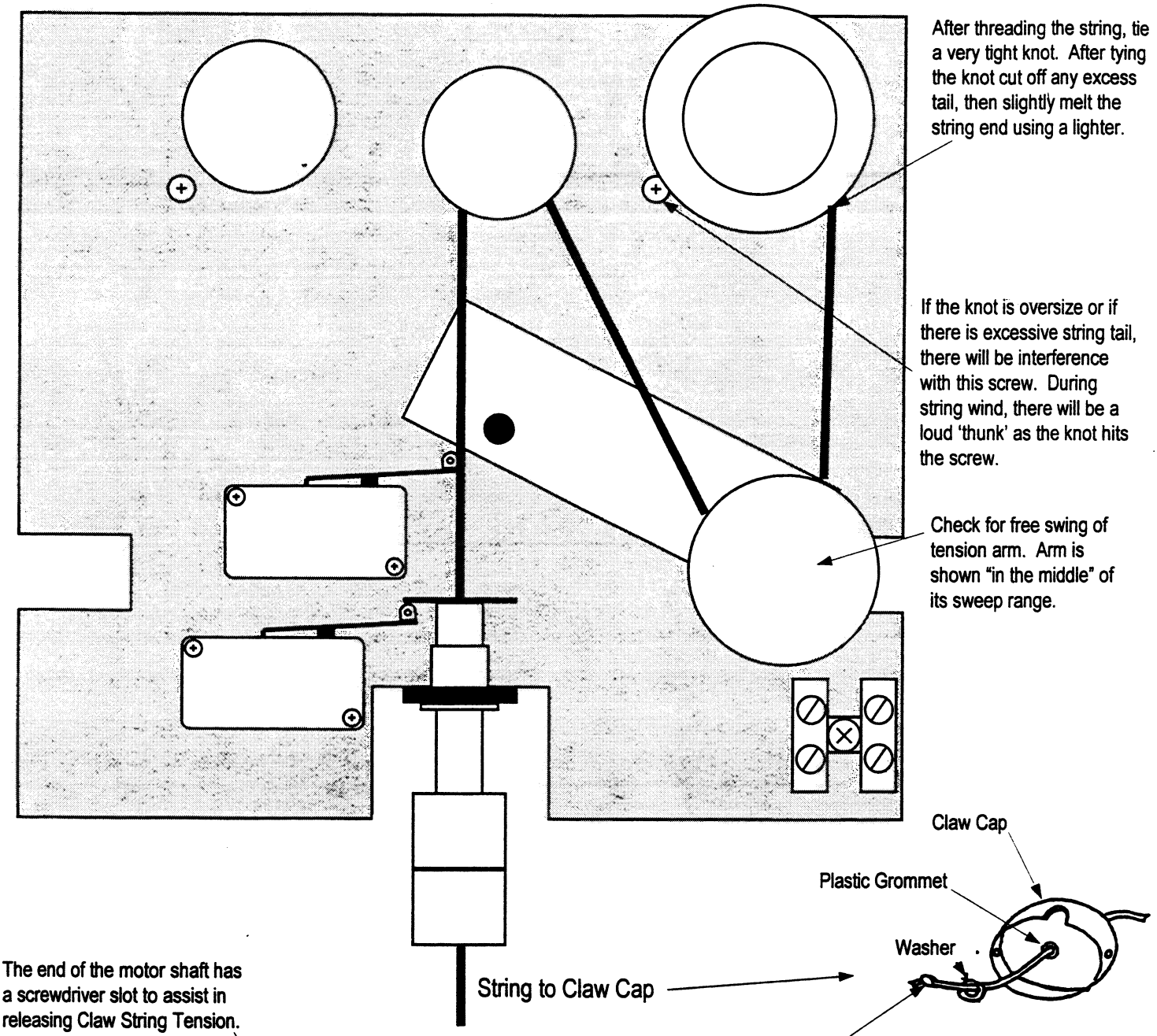
SW5 B+ Settings O O O O O O O O

* If Equiped w/o a Prize Detector

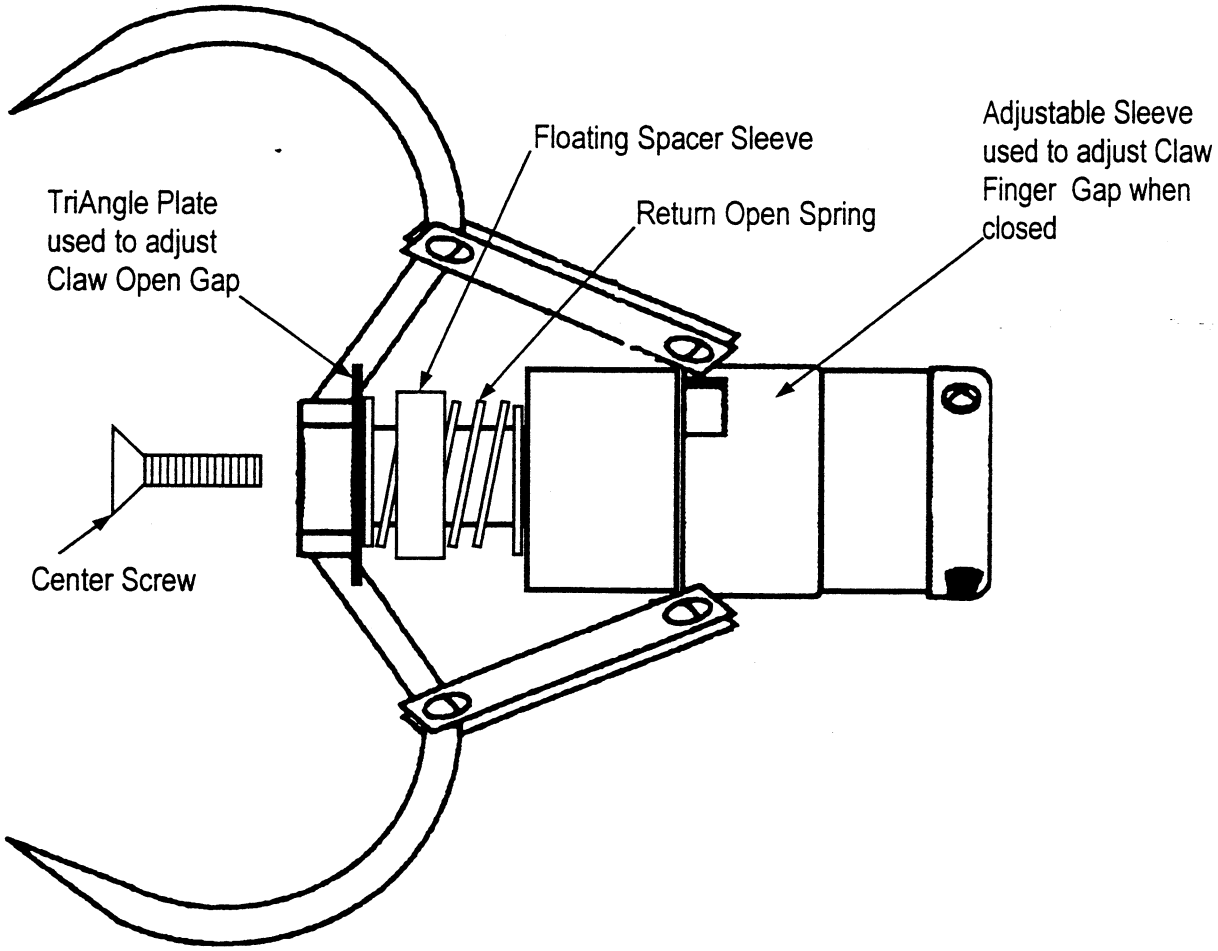








Smart CS and CSTS60 Trolley Claw String Routing



CLAW FINGER GAP ADJUSTMENT

1. Loosen center screw and rotate TriAngle Plate for an unenergized Claw Fingertip gap of 4" to 4.5" (If this gap is too great, the claw will appear to close sluggishly, or seem to close after the Claw starts upward travel. Payout will remain low even if the Claw Voltage is raised.
2. Energize claw - set machine Test and Service Mode #26.
3. Fine adjust Sleeve for Claw Fingertip gap of 3/16"".
4. Insure Claw Fingers move freeley.

Smart CSTS60 Claw Details

Sammy 7

Sports Arena

TROUBLESHOOTING GUIDE for Sammy Stop Shoppe / Sports Arena

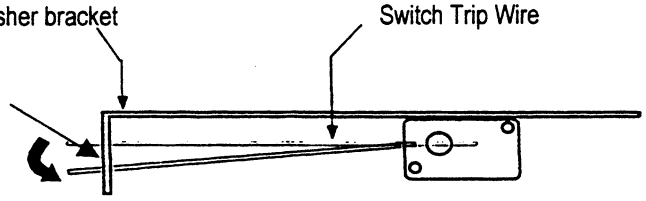
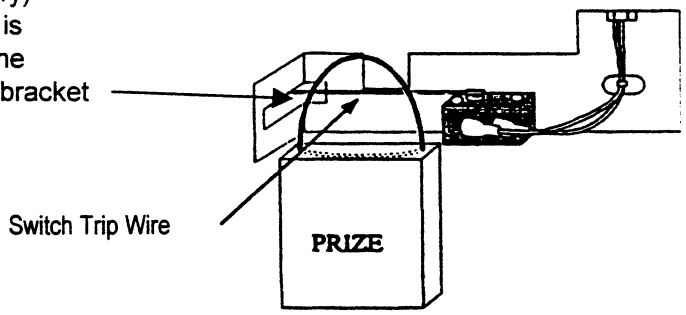
Symptom	Possible Solutions
No power or lights	* Power cord connected. * Check power source.
SEE CAUTION PAGE >	* Check MAIN fuse (next to on/off switch).
SEE CAUTION PAGE >	* Check main power switch connections.
Error Code "EC" flashing unit not accepting money	* Reset unit / Press CLEAR switch. * Check alignment of the trip wire located at the bottom of the coin chute on the coin acceptor. * Replace Main Logic Board.
No credits are given when Coins or Dollars are placed in the machine	* Check alignment of the trip wire located at the bottom of the coin chute on the coin acceptor. * Check DBA. * Replace the logic board.
DBA not accepting money	* Check DBA programming dip switches. * Replace DBA transport. * See DBA section.
Game counter does not work but machine accepts Money and games are shown on the LED	* Ensure proper connections are made at the main PCB. * Replace game counter. * Replace main logic board.
Free games being given	* Close the cabinet door tightly and repeatedly 'thump' coin mech. plate, Check if credits accumulate; check alignment of coin mech. switch. * Replace DBA.. * Replace the logic board.
Intermittent LED display operation	* Check ribbon is connected properly, key on plug fits into key slot of connector on the PCB. * Replace LED. * Replace the logic board.
Unit has sound and display but no flashing lights	* Check fuse on Lamp Driver Board. * Check 10A Slo-Blow Fuse near Power Supply. * Check Lamp Driver Board connectors and continuity. * Replace Lamp Driver Board.
Lights on but do not move in sequence	* Check Lamp Driver Board connectors . * Replace Lamp Driver Board.
Some lights do not light	* Replace Bulb. * Check Lamp Driver Board connectors . * Replace Lamp Driver Board.
Lights stay on continuously	* Replace Lamp Driver Board.

Unit "loses" all program settings	* Reset and reprogram unit.

Bad or No Sound	* Check Volume settings. * Check speaker wire and connections. * Replace speaker. * Replace Main Logic Board.

START / STOP Button not working	* Check switch connectors. * Insure button Switch is in it's retainer and the retainer is firmly and squarely seated into lower button body assembly. * Replace button assembly. * Replace Main Logic Board.

Carousel Unit not turning	* Check carousel using FILL Switch. * Temporarily exchange Carousel into a position known to work and test. * Replace Carousel assembly.

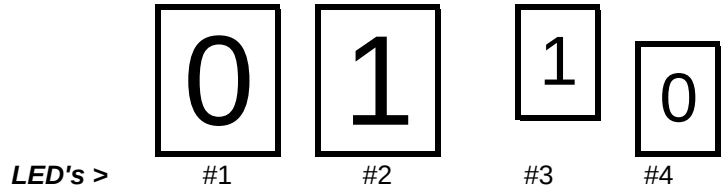
One carousel continuously empties or causes Error Code "EC"	*Check and Adjust Carousel Prize Switch as shown * Check (bend if necessary) that the switch trip wire is 'Open' as shown  * Check (bend if necessary) that the switch trip wire is centered in the slot of the Carousel Prise Pusher bracket 

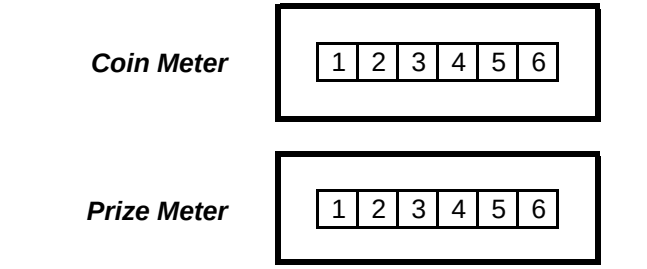
Main 10 amp power fuse continually blows ***SEE CAUTION PAGE***	* Check power outlet is 120V AC. * Check main power switch and fuse holder are not shorted. * Check to ensure all AC connectors in the machine are secure (three pronged connectors with white, black and green wires) * Remove all AC power connections in the machine. * Replace the blown 10 amp fuse with a new one: * Replace AC connectors one at a time. - AC to power supply. - AC to dollar acceptor. - AC to florescent toy area lights. * The short is in the last circuit which caused the fuse to blow. * Repair or replace the defective cable, connector or component.

STOP SHOPPE Programming Guide for A16A Chip Set

Reset Machine programming as follows:

1. Game must be ON
2. Push and hold "SERVICE" button until display LED 1 and LED 2 indicate "01"
   You are now at the "FUNCTION 01" setting.
   The "SETTING" can be adjusted with the "UP" & "DOWN" buttons.
3. Briefly push and release "SERVICE" button, display LED 1 and 2 will indicate "02"
   You are now at FUNCTION 02 setting
   SETTING can be adjusted with the "UP" and "DOWN" buttons
4. **Repeat for Functions 01 to r4 (Change settings as indicated below.)**
5. You **must** step through all FUNCTION positions and briefly press "**SERVICE**" one last time for changes to take effect. **Do Not exit by pressing CLEAR or turning the game OFF and ON, all SETTINGS changes will be lost.**
6. The UP and DOWN buttons will control Game Sounds volume in normal play mode.





FUNCTION	LED's 1 and 2	LED's 3 and 4	SETTING (Sugarloaf Default Settings)
Winability	01	10	
Coin / Credit	02	01	$0.50 per play
Lamp Speed	03	03	"fast"
Lamp Direction	04	02	Random
Replay	05	00	ON / allows extra try if prize wheel won was empty
Game Time	06	01	20 seconds
Tilt Alarm	07	00	ON
Attract Sound	08	00	ON
Free Play	09	00	OFF
Bonus	10	00	OFF
Prize Value	L1		Setting Based on Product on Carousel
Prize Value	L2		Setting Based on Product on Carousel
Prize Value	L3		Setting Based on Product on Carousel
Prize Value	L4		Setting Based on Product on Carousel
Prize Value	r1		Setting Based on Product on Carousel
Prize Value	r2		Setting Based on Product on Carousel
Prize Value	r3		Setting Based on Product on Carousel
Prize Value	r4		Setting Based on Product on Carousel

During Power Up, display should read "A16A"

ERROR CODES appearing on LED 1 and 2

- E L — Game has been Tilted or shaken. Should clear in 15 seconds after event
- E C — Coin Error, check for jammed coin in mech or stuck trip wire of coin switch
- L 1 — Prize won on an empty wheel.

SAMMY USA

SPORTS ARENA

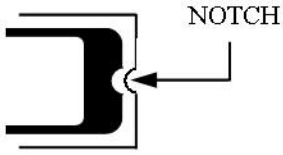
EP-ROM for Regular SA (Ver. 1.06)

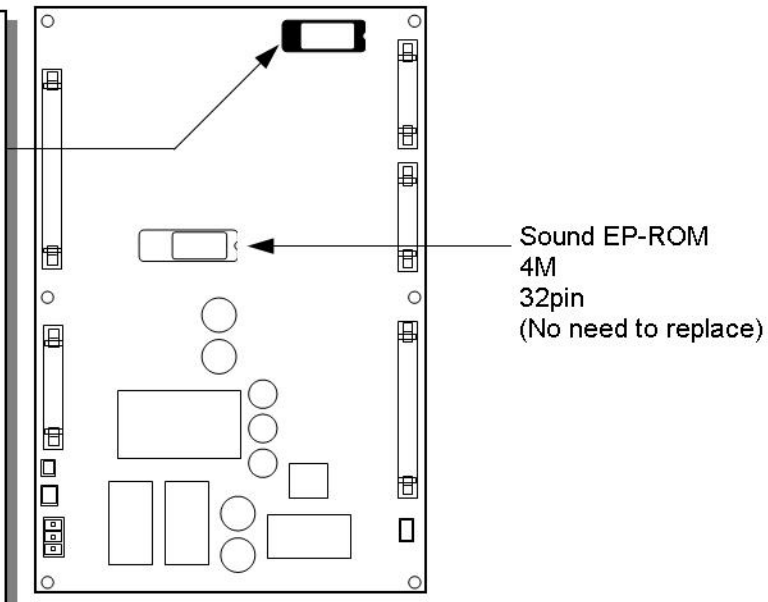
1) Exchange the EP-ROM to Ver. 1.06. Refer to picture below.

Program EP-ROM is here.
256K, 28pin

*Please replace this EP-ROM with **Ver. 1.06** EP-ROM.*

ATTENTION!!!
Please match the location of EP-ROM Notch as shown below.





VIEW OF MAIN PCB (PARTS SIDE)

After exchanging the EP-ROM, do the following to reset the MAIN PCB:

- Press and hold the SERVICE CREDIT SWITCH then re-power on the game. Continue to Press and hold the SERVICE CREDIT SWITCH until attract sound comes on.

NOTE:
You will have to re-set some Settings in the setting mode again, specifically pertaining to Winability and Lamp speed (See manual setting table.)

NOTE: LED must display "A16A" when the machine is powered on.

SETTING FUNCTIONS

The contents of each function follow the MANUAL SETTING TABLE.

01 WINABILITY

You can adjust the level of WINABILITY (difficulty) in this function.
When you adjust on SETTING #15, player will be able to win every play.

02 COIN / CREDIT

You can adjust value of the COIN CHUTE in this function.

03 LAMP SPEED

You can adjust speed of flashing lamps which are on the playfield in this function.

04 DIRECTION OF FLASHING LAMPS

You can adjust DIRECTION OF FLASHING LAMPS which are on the playfield in this function.

05 REPLAY

You can set REPLAY on or off in this function.
If you choose SETTING #0 (ON), the machine will give player a free play when player stops the lamp on an empty vending unit (with no prizes).

06 GAME TIME

You can adjust the time limit of AUTO STOP TIMER in this function.
It will stop the flashing lamps automatically when player does not hit the Stop Button during game play.

07 TILT ALARM

You can set TILT SYSTEM on or off in this function.
If you choose SETTING #0 (ON), the machine will make noise for about 15 seconds when the machine is shaken.

08 ATTRACT SOUND

You can set ATTRACT SOUND on or off in this function.

09 FREE PLAY

You can set FREE PLAY on or off in this function.

10 BONUS CREDIT

Use these settings for operator who has a bill acceptor on the machine.

L1 THROUGH r1 PRIZE VALUE OF EACH VENDING UNIT

An important feature of Stop Shoppe is the ability to change the value on each individual vending unit based on the prize's value (cost). In other words, the prizes can vary $0.25 up to $20.00 for each individual vending unit.
(The current factory setting is for $1.75 value on every vending unit in the game.)
It is very important that you set the vending units properly according to the MANUAL SETTING TABLE. By doing this properly the game will be able to adjust the difficulty for winning prizes of various values. If not done properly, it could result in unexpected vending. If you do not understand this section, please contact our service department for further details.

MANUAL SETTING TABLE (SA, MA)

FUNCTION# (LED1 & 2)	FUNCTION	SETTING# (LED3 & 4)	SETTING	NOTE
01	WINABILITY	0	HARDEST	5%
		1		10%
		2		15%
		3		17.5%
		4		20%
		5		22.5%
		6		25%
		7		27.5%
		8		30%
		9		32.5%
		10	*NORMAL*	35%
		11		37.5%
		12		40%
		13		45%
		14	EASIEST	50%
		15	WINNER EVERY PLAY	100%
02	COIN CHUTE	0	1 COIN / 1 CREDIT	$0.25 per play
		1	*2 COINS / 1 CREDIT*	$0.50 per play
		2	3 COINS / 1 CREDIT	$0.75 per play
		3	4 COINS / 1 CREDIT	$1.00 per play
		4	5 COINS / 1 CREDIT	$1.25 per play
		5	6 COINS / 1 CREDIT	$1.50 per play
		6	7 COINS / 1 CREDIT	$1.75 per play
		7	8 COINS / 1 CREDIT	$2.00 per play
		8	9 COINS / 1 CREDIT	$2.25 per play
		9	10 COINS / 1 CREDIT	$2.50 per play
		10	11 COINS / 1 CREDIT	$2.75 per play
		11	12 COINS / 1 CREDIT	$3.00 per play
		12	13 COINS / 1 CREDIT	$3.25 per play
		13	14 COINS / 1 CREDIT	$3.50 per play
		14	15 COINS / 1 CREDIT	$3.75 per play
		15	16 COINS / 1 CREDIT	$4.00 per play
		16	17 COINS / 1 CREDIT	$4.25 per play
		17	18 COINS / 1 CREDIT	$4.50 per play
		18	19 COINS / 1 CREDIT	$4.75 per play
		19	20 COINS / 1 CREDIT	$5.00 per play
03	LAMP SPEED	0	SLOWEST	
		1	SLOW	
		2	NORMAL	
		3	*FAST*	
		4	FASTER	
		5	FASTEST	
		6	RANDOM FAST	Combo of normal & fast
		7	RANDOM SLOW	Combo of normal & slow

"FACTORY INSTALLED" SETTING

FUNCTION# (LED 1 & 2)	FUNCTION	SETTING# (LED 3 & 4)	SETTING	NOTE
04	DIRECTION OF FLASHING LAMPS	0	CLOCKWISE	
		1	COUNTER CLOCKWISE	
		2	*RANDOM*	Combo of both ways
05	REPLAY	*0*	*ON*	If prize vending unit is empty, player will get free replay.
		1	OFF	
06	AUTO STOP TIMER	0	10 SECONDS	Lamps will stop automatically if player does not hit stop button.
		1	*20 SECONDS*	
		2	40 SECONDS	
		3	60 SECONDS	
07	TILT SYSTEM	*0*	*ON*	
		1	OFF	
08	ATTRACT SOUND	*0*	*ON*	
		1	OFF	
09	FREE PLAY	*0*	*OFF*	Regular Game
		1	ON	Free play
10	BONUS CREDIT	*0*	*OFF*	
		1	4 COINS / 3 CREDITS	$1.00/3 CREDITS
		2	20 COINS / 11 CREDITS	$5.00/11 CREDITS
L1 THROUGH r4	PRIZE VALUE OF EACH VENDING UNIT	0	$0.25	Use these settings when using prizes of various values. You can set each individual vending unit based on the prize cost. (These setting determined by Mgmt.)
		1	$0.50	
		2	$0.75	
		3	$1.00	
		4	$1.50	
		5	*$1.75*	
		6	$2.00	
		7	$2.50	
		8	$3.50	
		9	$5.00	
		10	$7.50	
		11	$10.00	
		12	$12.50	
		13	$15.00	
		14	$17.50	
		15	$20.00	

"FACTORY INSTALLED" SETTING

A&A Parkway EBV 8

Kid Shoppe

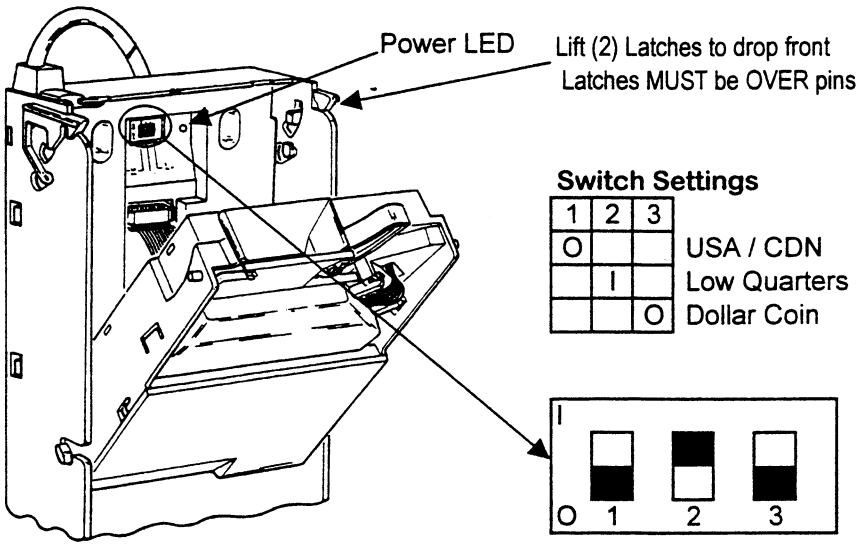
TROUBLESHOOTING GUIDE for A&A Parkway EBV [Kid Shoppe]

Symptom	Possible Solutions
No power or lights SEE CAUTION PAGE >	* Power cord connected. * Check power source. * Check main power switch and connections.
Single Head Motor does not turn	* Check lamp in Head during vend cycle. * Check motor connector. * Check for jam in product wheel. * Check for jammed / out-of-time product wheel. * Check motor operation w/ Head removed. > Interchange Motor from adjacent operating Head. * Replace motor.
Multiple Head Motors do not turn	* Check wire harness between Rack Shelf and Control Console. * Check harness connector inside Control Console. > Interchange harness connectors between top and bottom shelves; Test * Check connectors of Main Logic Board. * Replace Main Logic Board.
Multiple Motors turn at once	* Check wire harness between each Head and Rack Shelf. * Check wire harness between Rack Shelf and Control Console. * Check harness connector inside Control Console. > Interchange harness connectors between top and bottom shelves; Test * For every motor turning at once; unplug Head connector one-at-a-time; Test. * Check connectors of Main Logic Board. * Replace Main Logic Board.
Constant Product Jam	* Check for jammed / out-of-time product wheel. * Insure Product Wheel gear teeth fully engage to motor gear. * Empty head / Refill 1/4 and Test / Hand fill remaining product. * Check front plex seated properly. * Insure Lock tightened securely. * Replace Motor.
Does Not accept Dollars	* Check for sufficient change in coin tubes. * Check DBA * Check connectors of Main Logic Board. * Check MDB signal using Audit Systems Box LED * Replace DBA.
Does Not accept coins / Coins returned to tray	* Check Coin Changer Power LED * Check Coin Changer * Check connectors of Main Logic Board. * Check MDB signal using Audit Systems Box LED * Replace Coin Changer.

Does Not return proper change	* Check all Head prices programming. * Check for sufficient change in coin tubes. * Check for coin jams in each tube. * Check coin eject solenoid operation in each tube * Replace Coin Changer.

Loses Programmed Pricing	* Reset machine w/ Power Switch > Reprogram pricing; Cycle Power Switch; Test * Replace Main Logic Board.

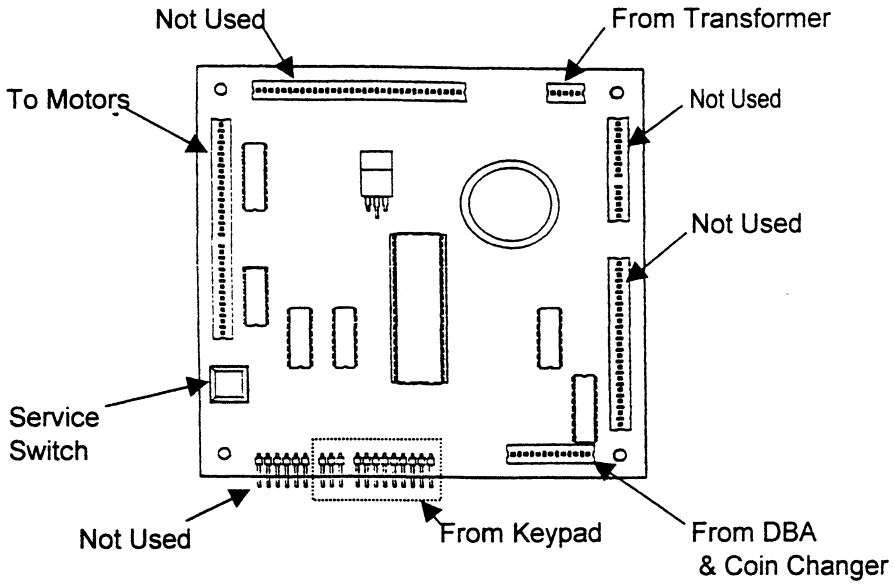
Coin Changer Programming



Troubleshooting / MDB Error Codes

CScf	Invalid change scale factor	Replace Coin Changer
tSnS	Defective coin tube sensor	Replace Coin Changer
CJAM	Coin jam detected	Clear jam in coin path
tJAM	Coin Tube jam detected	Clear all coin tubes
CnEr	Coin Acceptance problem	Replace Coin Changer
AcEr	Acceptor unplugged	Check all connectors
ChEr	Coin Changer ROM error	Replace Coin Changer
bScF	Invalid validator scale factor	Replace Coin Changer
bSnS	Defective Bill sensor	Replace DBA
bJAM	DBA Bill jam	Clear DBA bill path
StFL	DBA Bill Stacker full	Empty box
CShb	DBA Bill Box out of position	Reset Bill Box and Optic Head
bMtr	DBA Bill Motor bad	Replace DBA
bLEr	DBA ROM error	Replace DBA

Main Logic Board Connector Layout



> ALWAYS turn machine OFF before unplugging or replugging any connection

Rack Head to Control Unit Connector Pinouts

- Rear View of Cable Plugs

GY COMMON		GN HEAD #6	ON HEAD #4	BN HEAD #2
	BU HEAD #7	YL HEAD #5	RD HEAD #3	BK HEAD #1

Harness shown for
(7) Heads

Control Console Programming Features

> Press and release the Service Switch pushbutton on the Main Logic Board

> Use the frontpanel keys for all remainig steps

PRESS	Display Reads	Press	Function	
1 COIN DISPENSE	coin	A B C	Dispenses Nickles Dispenses Dimes Dispenses Quarters	
2 MOTOR COUNT			Will indicate the number of motors with connection	
3 ACCOUNT	Acct	A B	Total Vend Count Total Cash Count	Display indicates in 8 digits, starting w/ first 4 then last 4
4 PRICE SETTING	Prc	A1 UP Arrow DN Arrow	Selects Head Increases Price -or- Decreased Price	
		>> Continue through all installed Head locations <<		
		D9 UP Arrow DN Arrow	Selects Head Increases Price -or- Decreased Price	
5 SINGLE VEND TEST	Slct	A1	Selects Head; Motor will turn -or- Display will show FAIL	
		A2	Selects Head; Motor will turn -or- Display will show FAIL	
		>> Continue through all installed Head locations <<		
		D9	Selects Head; Motor will turn -or- Display will show FAIL	
6 MACHINE TEST VEND			Test runs all positions	A1 to A9 B1 to B9 C1 to C9 D1 to D9
E VEND OPTIONS	Optn	A B C D F	Force Vend Bill Escrow Muliti-Vend Canned Drink Free Vend	On / Off On / Off On / Off On / Off On / Off	Set to ON Set to ON Set to ON Set to OFF Set to OFF

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I.C.E. CRANE TIP's

Table of Contents

INTRODUCTION

GAME FEATURES

The brand new PINNACLE™ all metal crane game by I.C.E. was designed with the operator in mind. Reliability, low maintenance, themed cabinetry, and all metal construction are the key design features, exactly what is needed to ensure a combination of long life and high profit.

With nearly the entire construction made of metal, it was only natural to Powder Epoxy Coat everything , inside and out. This provides the owner - operator with a game that will certainly outlast its wooden counterparts for many years to come. The major advantages of all metal construction include:

- Vault like security
- Long service life
- Low maintenance, and High Durability to mention a few.

All windows, of the PINNACLE™, are 1/4" tempered plate glass to provide an easy to clean, maximum safety, scratch resistant surface. Other features include, 40 strand conductor cables, to prevent wire fatigue, a full range operator adjustable software, and a newly designed crane mechanism.

The first step in ICE's new crane design was to select several leading cranes available on the market today, observe and determine what problems can be or are causes of failure and costly down time. ICE then surveyed operators nation wide, requesting information like:

- What are the leading causes of crane failures in your locations
- What are some problems in servicing cranes.
- What changes would you make to current cranes to create a better machine.

ICE's engineers then compiled all critical data, addressed and corrected each problem and use this information to created what we now call the PINNACLE™.

This method of design ensures that the needs and concerns of the owner-operators dictate the final design parameters, for who knows a cranes attributes and faults better than a crane operator.

GAME PLAY

As coins are inserted into the PINNACLE™ all metal crane game, the sound of a "BUS" starting is heard. When sufficient coins have been inserted, the engine starts, the claw clicks closed and re-opens, which signals the start of the game. The crane will then position its self in the middle of the "play field* and remain there, with the engine running, until the player is ready.

When the player has moved the joystick or pressed the buttons, to move the crane, the timer on the right display will begin to count down. The player will then position the crane above the prize they are attempting to win and press the drop button to lower the claw.

If the nudging option is on, then the player will have the ability to keep "nudging" the claw down each time the button is pressed to hone in on the chosen prize. If the nudging option is off, then the player will have only one chance to drop the claw.

When the claw has fully dropped it will close and retract to its upper most position. The crane will then automatically position its self over the prize chute at the rear of the cabinet. The claw will then open, releasing the prize into the prize chamber. The player can now remove the prize from the chamber through the prize door located in the front, lower left corner of the game. The game is now in its home position and is ready for the next player in line.

* - The crane will remain in the home position if the game mode (option 0) is set to 2, 3 or 4 In these options the player may only have two buttons, one for right travel and one for forward travel. The crane will remain in the home position to allow the player access to the entire play field.

SETUP/TESTING/MAINTENANCE

SAFETY PRECAUTIONS

IMPORTANT: FAILURE TO FOLLOW THESE DIRECTIONS CLOSELY COULD CAUSE SERIOUS DAMAGE TO YOU AND/OR YOUR GAME.

WARNING: WHEN INSTALLING THIS GAME, A 3 PRONG GROUNDED RECEPTACLE MUST BE USED. FAILURE TO DO SO COULD RESULT IN SERIOUS INJURY TO YOURSELF OR OTHERS. FAILURE TO USE A GROUNDED RECEPTACLE COULD ALSO CAUSE IMPROPER GAME OPERATION AND/OR DAMAGE TO THE ELECTRONICS.

DO NOT DEFEAT OR REMOVE THE GROUNDING PRONG ON THE POWER CORD FOR THE SAME REASONS AS GIVEN ABOVE. USING AN IMPROPERLY GROUNDED GAME COULD VOID YOUR WARRANTY.

GAME SET-UP

BEFORE PLUGGING THE GAME IN, OR TURNING IT ON, BE SURE THE GAME HAS BEEN SET TO THE PROPER VOLTAGE. YOUR GAME SHOULD COME PRE-SET FROM THE FACTORY TO THE CORRECT VOLTAGE, HOWEVER IT IS A GOOD IDEA TO CHECK THE A.C. WALL RECEPTACLE VOLTAGE BEFORE PLUGGING THE GAME IN.

ASSEMBLY INSTRUCTIONS

1. Carefully unbox the game from its packaging.
2. Using the supplied keys, unlock the front door of cabinet.
3. Cut all tie wraps holding the wagon assembly and crane assembly in place.
4. Plug the game into a three prong grounded receptacle. NOTE: The appliance must be positioned such that the plug is accessible during use.
5. The game is now ready for start up.

TESTING

After the initial setup, it is time to test your game for proper operation.

1. Locate the game in it's permanent location and lock casters
2. Be sure the game has been properly plugged into a 3 prong grounded outlet, and that the receptacle is in good working order.
3. If using an extension cord, be sure it is a 3 prong grounded type of at least 16 Ga.
4. Verify that the game is set up for the proper voltage, and turn power to the game on.
5. The game will run through a test mode at every start up. See test mode explanation in the programming section for details.
6. Insert coins/bills at least ten times into the coin mech/bill acceptor to assure proper operation.
7. Check the credit and prize counters for proper operation.
8. Check that the door disconnect switch works properly.
9. Check game volume during busy time at location to set it at the proper level.

CLEANING

Regular cleaning of the game will keep it looking new, and greatly enhance its appeal.

Clean the windows of your PINNACLE™ with a standard window cleaner such as Windex®

Clean the cabinet sides with a good cleaner such as "Fantastic" or "409" and a soft rag. A mild soapy solution can also be used.

NOTE: DO NOT USE ALCOHOL, THINNERS OF ANY KIND, OR PINBALL PLAY FIELD CLEANERS ON ANY OF THE CABINET SURFACES, ESPECIALLY THE DECALS.

IF YOU HAVE ANY QUESTIONS OR COMMENTS REGARDING INSTALLATION OR PROPER FUNCTION OF YOUR GAME, PLEASE CALL OUR SERVICE DEPARTMENT AT 1-716-759-0360

SETUP/TESTING/MAINTENANCE

CLAW SHAPE

In an attempt to satisfy all variables associated with proper payout ICE has opted to include directions on how to reshape your medium claw for a lesser and greater mechanical advantage. Below are two medium claws shapes which will give very different mechanical advantages and ultimately very different claw strengths.

-When option 8 is set to 50 and you are still picking up plush, then you will need to reshape you 3 claws to look more like shape "A". (SEE FIG. 2) NOTE: Be sure to align holes in claw with drawn holes in the template. This will assure proper shaping of the claw.

- When option 8 is set to 99 and you are unable to pick up consistently then you will need to reshape your 3 claws to look more like shape "B". (SEE FIG. 2) NOTE: Be sure to align holes in claw with drawn holes in the template. This will assure proper shaping of the claw.

These are two claw shapes that ICE has proven to work well, although there are many other shapes that may work. You will need to remove the claws from the claw mechanism by following the steps.

1. Remove the claw mechanism from the coil housing by loosening the three screws on the coil slider and removing. Be sure not to loose the small spring around the plunger and the black rynite washer below the spring. These two parts are critical in the proper operation of the crane mechanism. (SEE FIG 1)

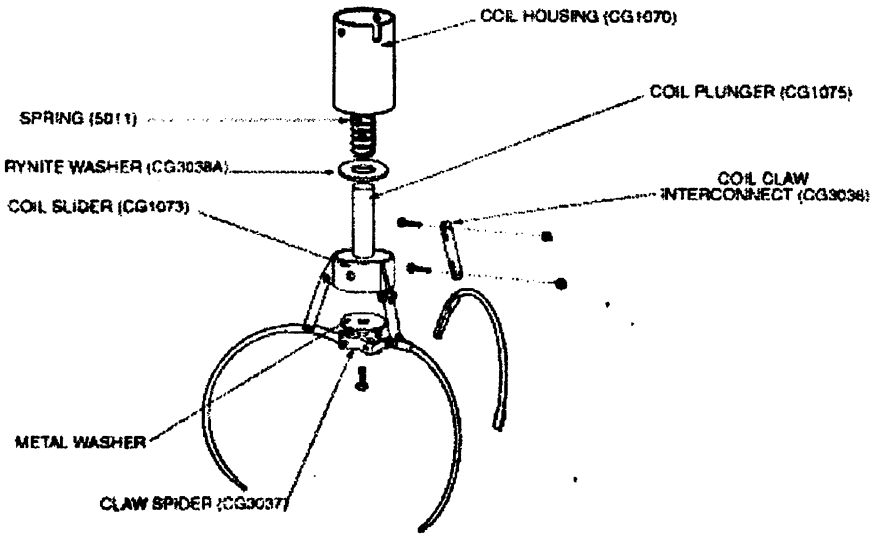
2. Loosen and remove the 6 small philips head machine screws and nylock nuts attaching the three claws to the coil-claw interconnect and coil spider (SEE FIG 1)

3. Reshape the claws according to the CLAW SHAPE Templates "A" or "B".

4. Re assemble in reverse order.

Now that you have reshaped your claws for your plush, return to the beginning of Adjustment tips and proceed through each step.

FIG.1



PROGRAMMING

Mode (Credit Display)	Description	Min/Max/Def (Timer Display)	Meaning
		BASIC PROGRAMMING	
0	Game Type	0,4,0	0 - Left, Right, Forward, Backward, Nudge 1 - Left, Right, Forward, Backward, Drop 2 - Right, Forward, Nudge 3 - Right, Forward, Drop 4 - Single Move, Drop
1	Game Mode	0 ,1,0	0 - Normal Play 1 - Play till you win
2	Time	10,60,20	10-60 Seconds (Inc. every 5 seconds)
3	Coin	0,9,2	0 - Free Play 1-9 Coins required for a single credit
4	Bill	0,9,4	0 - Off 1-9 Number of coins each bill is worth
5	Counter Type	0,1,0	0 - Credit counter 1 - Coin counter
6	Attract	1,30,20	1-30 Minutes between attract modes
7	Attract Type	1,2,2	1 - Motion only 2 - Audio and motion
8	Manual Strength	40,99,40	40-99 Claw strength Inc. by 1 (99 = MAX)
		ADVANCED PROGRAMMING	
9	Auto Strength	0,99,0	0 - Auto off [redacted]
10	F/B Speed	10,20,20	10 = Low speed 20 = High speed
11	L/R Speed	10,20,20	10 = Low speed 20 = High speed
12	Up Speed	15,20,20	10 = Low speed 20 = High speed
13	Down Speed	15,20,20	10 = Low speed 20 = High speed
14	Right Time — 0	0,40,8	0-40 Number of 1/4 sec time intervals right
15	Forward Time — 0	0,40,5	0-40 Number of 1/4 sec time intervals forward
16	Plush Cost	1,20,4	Coins per piece of plush
17	Payout	20,50,33	20-50 Desired payout percentage
18	Tickets to play	0,99,0	0-99 tickets to be paid just to play game
19	Tickets if loose	0,99,0	0-99 tickets to be paid if you do not win plush
20	Factory Default	0,1,0	0 - Normal 1 - Restore factory defaults upon next startup
21	Center On/Off	0,1,0	0 - Center option off 1 - Center option on
22	Snap On/Off	0,1,1	0 - Snap option off 1 - Snap option on
23	Up/Down Motor Test	DIAG.	Right display changes: 0-1 Up switch is made 0-2 Down switch is made 0-3 Both switches are made
24	Left/Right Motor Test	DIAG.	Right display changes 0-1 Left switch is made
25	Front/Back Motor Test	DIAG.	Right display changes 0-1 Back switch is made

PROGRAMMING

Mode Explanations

. *GAME TYPE* - There are 5 game types:

- 0 Left, Right Forward Backwards, Nudge - This mode is for a control panel that commonly has a joy stick and allows the player to lower the claw each time the drop button is pressed. This allows the player to hone in on the prize they are attempting to win. NOTE: The crane will position its self according to the operator presets, options 14 and 15, *at coin up if option 21 is set to "0" (off)*. The crane head will position its self according to the operator presets, options 14 and 15, *at the end of the game if option 21 is set to "1" (on)*.
- 1 Left, Right Forward Backwards Drop - This mode is for a control panel that commonly has a joy stick and the claw drops fully when the drop button is pressed. NOTE: The crane will position its self according to the operator presets (options 14 and 15) *at coin up if option 21 is set to "0" (off)*. The crane head will position its self according to the operator presets, options 14 and 15, *at the end of the game if option 21 is set to "1" (on)*
- 2 Right Forward Nudge - This mode is for a control panel that commonly has 3 buttons, one to move right, one to move forward and one to drop the claw. The player also has the ability to lower the claw each time the drop button is pressed. This allows the player to hone in on the prize they are attempting to win NOTE: Option 21 is not available with this mode and will remain at "0" (off)
- 3 Right,Forward,Drop - This mode is for a control panel that commonly has 3 buttons, one to move right, one to move forward and one to drop the claw. The claw drops fully when the drop button is pressed. NOTE: Option 21 is not available with this mode and will remain at "0" (off)
- 4 Single Move Drop - This mode is for a control panel with two buttons only, one to move forward and one to move right. At coin up the crane will remain over the prize chute to give the player full access to the playfield. The player will have a chance to move the crane once forward and once to the right, after which the claw will automatically drop.

. *GAME MODE* - There are 2 game modes:

- Normal play - This is the standard type of play where a player has inserted enough coins to create 1 credit and then plays the game. Whether the player wins a prize or not, the game is over.
- Play till win - In this mode the player has inserted enough coins to create 1 credit and will be able to play the game until they win a prize.

. *TIME* - This option allows the operator to set the game play length. Options are from 10 seconds to 60 seconds in 5 second intervals.

. *COIN* - This option allows the operator to set the number of coins needed to create 1 credit. A setting of "0" will put the game into free play.

4. .*BILL* - This option allows the operator to set the number of coins each bill is worth. A setting of "0" turns this option off.

5. *COUNTER TYPE* - Setting this option to "0" will have the game count credits on the mechanical and software counters. Setting this option to "1" will have the game count coins.

6. *ATTRACT* -This option allows the operator to set the number of minutes between attract modes. Available settings are from 1 minute to 30 minutes in 1 minute intervals.

7. ATTRACT TYPE - This option allows the operator to choose what type of attract mode they want.

- "1" will have an attract mode with movement only.
- "2" will have an attract mode with both audio and movement.

PROGRAMMING

10. *MANUAL STRENGTH* - This option allows the operator to set the strength of the claw for manual percentaging. Available claw strengths are 50-99 with 99 = 100 % claw strength. NOTE: When in this mode the claw will open and close with the strength set in this mode. The operator will be able to feel each strength setting to determine which best suits their needs. When the correct strength setting is determined the operator can just move to the next option, and the manual strength option is set.

11. *AUTO STRENGTH* - This option allows the operator to set the claw strength for the auto percentaging mode. Available claw strengths are 50-99 with 99 = 100 % claw strength. NOTE: When in the auto percentaging mode the claw will, at bottoming, close with 100 % strength and will then be backed off to the number set in this mode. i.e. With this mode set to 75, the claw will, at bottoming, close with 100 % strength then back off to 75. NOTE The claw will open and close allowing the operator to feel each strength setting to determine which best suits their needs. When the correct strength setting is determined the operator can just move to the next option, and the auto strength option is set.

0. *F/B SPEED* - This option allows the operator to adjust the forward / backward speed of the crane. The available speeds are 10-20 with 10 being slow and 20 being fast.

11. *L/R/SPEED* - This option allows the operator to adjust the left /right speed of the wagon. The available speeds are 10-20 with 10 being slow and 20 being fast.

12. *UP SPEED* - This option allows the operator to adjust the up speed of the crane. The available speeds are 15-20 with 15 being slow and 20 being fast.

13. *DOWN SPEED* - This option allows the operator to adjust the down speed of the crane. The available speeds are 15-20 with 15 being slow and 20 being fast.

14. *RIGHT TIME* - This option allows the operator to adjust the time the right drive motor will stay on, for centering purposes at game start up. Available time settings are 0-40 intervals of 1/4 sec. EXAMPLE If this option is set at 5, then at coin up the right drive motor will stay on for (5*1/4 sec = 1 1/4 sec.) 1 1/4 sec. This option is used to correctly center the crane at coin up with different motor speeds and crane sizes. An operator can also use this option along with option 21 to adjust the position of the crane head when the game is over.

15. *FORWARD TIME* - This option allows the operator to adjust the time the forward drive motor will stay on, for centering purposes at game start up. Available time settings are 0-40 intervals of 1/4 sec.. EXAMPLE If this option is set at 5, then at coin up the forward drive motor will stay on for (5 * 1/4 sec = 11/4 sec.) 1 1/4 sec. This option is used to correctly center the crane at coin up with different motor speeds and crane sizes. An operator can also use this option along with option 21 to adjust the position of the crane head when the game is over.

16. *COST PLUSH.* - The operator will use this option to detail the cost of an average piece of plush used in their crane, in terms of the lowest denominator coin used to coin up the game. EXAMPLE: If the average cost of a piece of plush is $1.50 and the lowest denominator coin used to coin up the game is $0.25 then the number entered for this option will be 6 ($1.50/$0.25 = 6). The available plush costs for this option are 1-20.

17. *DESIRED PAYOUT* - The operator will input the desired payout for the auto percentaging mode. The available percentages for this option are 20%-50%.

8. TICKETS *TO PLAY* - This option is only used if you have a ticket dispenser. In this option the operator has the ability to set the number of tickets that a player will be awarded just for playing the game. The available range is 0-99 tickets.

19. TICKETS *IF LOSE* - This option is only used if you have a ticket dispenser. In this option the operator has the ability to set the number of tickets a player will be awarded when a piece of plush in not won. The available range for this option is 0-99 tickets.

20. *FACTORY DEFAULTS* - A setting of "0" for this option will keep the latest operator settings A setting of "1" for this option will restore all options to factory defaults.

21. CENTERING - This option allows the operator to position the crane head any where on the play field. If option 21 is set to "0" (Off) the crane head will position its at the *beginning* of the game according to the operator pre sets in options 14 and 15. If option 21 is set to "1"(On) the crane head will position its self at the *end* of the game according to the operator presets in options 14 and 15.

22. SNAP - This option allows the operator to turn on and off the snap of the claws at the start of a game. If option 22 is set to "0" (Off) the claws will not snap together at the start of a game. If option 22 is set to "1"(On) the claws will snap together at the start of a game.

23. UP/DOWN MOTOR TEST - When the operator moves the joystick left and right the claw will raise and lower respectively. The right display will change from: 0-1 If the up switch is made
0-2 If the down switch is made
0-3 If both switches are made

24. LEFT/RIGHT MOTOR TEST - When the joystick is moved left and right the wagon assembly will move to the left and right The right display will change from:
0-1 If the left home switch is made

25. FRONT/BACK MOTOR TEST -When the joystick is moved left and right the crane assembly will move forward and backwards. The right display will change from:
0-1 If the back home switch is made

Entering the Programming Mode

To enter the programming mode, open the front door and press the button marked PROG. located on the main board housing inside the front door and the crane will move to the front center of the game. NOTE: The game WILL NOT go into programming mode if the door is "closed", or the door switch has been pulled to its outer most position. Once you are in the programming mode move the joystick forward and backward or use the forward button to move through the modes. To change the value of the mode move the joystick left and right or use the right button. Once all options have been set, press the drop button and the game will return to regular game play with the new settings. For a 2 button control panel press the third button located inside the front door.

Entering the Accounting Mode

To enter the accounting mode, unlock and open the front door and press the button marked ACCOUNT. located on the main board housing inside the front door. The left displays will flash between "cr" (Credits) then the number of credits 1-9999. If the operator presses the drop button the displays will flash "pl" (PLUSH), then the number of plush that has passed through the sensor. Theses numbers can never be reset and WILL NOT match the numbers on the mechanical counters from the counters. It is advisable that the owner note this difference so that they will be able to track actual software coins/credits and plush out vs the mechanical counters for accounting purposes.

Test Mode Explanation

Every time that the game is powered up, or the door is closed, the game will run through a test mode to check the following items.

- HOME BACK SWITCH	- FRONT / BACK MOTOR	-PRIZE SENSOR
- HOME LEFT SWITCH	- LEFT / RIGHT MOTOR	-OUT OF RANGE
- UP SWITCH	- CREDIT/COIN DISCONNECT	-E^2 (MEMORY)
- DOWN SWITCH	- CLAW CLOSE, CLAW OPEN	

If any of the above items are malfunctioning, the game will light up the 4 decimal points on the podium displays. This will alert the operator that there has been a problem. The operator needs only unlock and open the front door and the error codes will be displayed one at a time on the left display. To move to the next error code the operator needs to press the drop button. Repairs should be made to those areas in

which errors have been logged. When all codes have been seen and the door is closed the game will reset the error codes, run through a test mode to check for proper operation and if all is well, game play can start, if not the 4 decimals will once again light up and the operator will needed to check the error codes again. Game play can continue to the best of the machines abilities, with problems, until the errors are corrected. At no time should the game be inoperable unless a key component is damaged.
Error code 10/11 will alert the operator that the game has paid out 8 too many or 8 too little pcs of plush when in auto percentaging. If this error is logged the game will automatically revert to MANUAL settings until one of the following options has been changed. (COST OF PLUSH, AUTO % MIN.,% PAYOUT, OR GAME COST) This is why it is imperative that the manual setting be setup before auto percentaging is used.

NOTE: Changing one of these options will reset error code 10/11 and the game will begin auto percentaging with the new settings.

NOTE: Some items on the list can not be detected by the game and require that the operator watches for theses actions to be performed during the start up test mode. (Claw close, Claw open).

Error Codes

#	Problem	Solution
1	E^2 (Memory)	Replace Microprocessor @U7
2	Prize Sensor	Check/Replace Prize Sensor
3	Up Sensor	Check/Replace Up Sensor
4	Down Sensor	Check/Replace Down Sensor
5	Left/Right Sensor	Check/Replace L/R Sensor
6	Front/Back Sensor	Check/Replace F/B Sensor
7	Front/Back Motor	Check/Replace F/B Motor
8	Left/Right Motor	Check/Replace L/R Motor
9	Counter Disconnect	Just a warning that the credit/coin counters were disconnected at some time.
10	Out Of Range (High)	Change setting for the Cost of Plush, Auto % min, % Payout, or Game Cost
11	Out Of Range (Low)	Change setting for the Cost of Plush, Auto % min, % Payout, or Game Cost

QUICK TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	SOLUTION
THE DECIMALS ON THE 4 DISPLAYS ARE LIT UP	THIS IS IN FACT NOT A PROBLEM BUT A WAY OF LETTING THE OPERATOR KNOW THAT THERE WAS A PROBLEM DURING THE TEST START UP MODE	OPEN THE FRONT DOOR AND THE ERROR CODES ARE SHOWN ON THE DISPLAYS. TO ADVANCE THROUGH THE ERROR CODES, PRESS THE FIRE BUTTON.
NO GAME POWER	ON-OFF SWITCH ON THE GAME IS TURNED OFF BLOWN A.C. POWER FUSE GAME NOT PLUGGED IN OR CORD DAMAGED BAD TRANSFORMER TRANSFORMER HARNESS NOT CONNECTED BAD POWER MODULE	TURN POWER ON REPLACE WITH PROPER FUSE CHECK POWER CORD CHECK FOR PROPER VOLTAGES CHECK HARNESS REPLACE POWER MODULE
GAME WILL NOT TAKE MONEY OR GIVE CREDITS CORRECTLY.	BAD COIN SWITCH COIN DISCOUNTING OPTION SET WRONG COINS PER CREDIT SETTING INCORRECT BAD COIN MECHANISM LOOSE OR DAMAGED HARNESSING BAD MAIN P.C. BOARD	CHECK W/METER AND REPLACE CHECK PROGRAMMABLE SETTING CHECK PROGRAMMABLE SETTING ADJUST OR REPLACE CHECK W/METER - REPAIR REPAIR OR REPLACE MAIN BOARD
DISPLAYS DO NOT WORK	BAD 12 VOLT FUSE BAD DISPLAY P.C. BOARD BAD MAIN P.C. BOARD LOOSE OR DAMAGED DISPLAY HARNESSING	REPLACE WITH PROPER FUSE REPAIR OR REPLACE P.C. BOARD REPAIR OR REPLACE P.C. BOARD CHECK W/METER AND REPAIR
CRANE OR WAGON DOES NOT MOVE	BAD MOTOR LOOSE OR DAMAGED HARNESSING BAD SWITCH ON BUTTON OR JOYSTICK BAD HARNESSING TO BUTTONS OR JOYSTICK BLOWN FUSE TO MOTORS ON MAIN PCB	REPLACE MOTOR CHECK W/ METER - REPAIR REPLACE SWITCH CHECK W/METER REPAIR REPLACE WITH PROPER FUSE
CRANE KEEPS TRYING TO MOVE IN THE HOME POSITION	BAD LIMIT SWITCH(S) LIMIT SWITCH NOT ALIGNED WITH ACTUATOR	REPLACE SWITCH(S) ALIGN SWITCH AND ACTUATOR
CLAW WILL NOT CLOSE	BLOWN FUSE TO CLAW ON MAIN PCB BAD COIL LOOSE OR DAMAGE HARNESSING CLAW HAS MECHANICALLY JAMMED	REPLACE WITH PROPER FUSE REPLACE COIL CHECK W METER AND REPAIR FIND JAM AND REPAIR
CLAW STAYS CLOSED	BAD DRIVE TRANSISTOR ON MAIN P.C. CLAW HAS MECHANICAL LOCKED	REPLACE TRANSISTOR FIND JAM AND REPAIR
AUTO PERCENTAGING IS NOT FUNCTIONING	PROGRAMMING IS NOT CORRECTLY SET BAD PRIZE SENSOR LOOSE OR DAMAGED SENSOR HARNESS	SET OPTIONS "9 "AND "16" REPLACE PRIZE SENSOR CHECK W/METER AND REPAIR
CLAW GOES DOWN AND THEN UP BUT DOES NOT CLOSE	DOWN SWITCH BAD LOOSE OR DAMAGED HARNESS TO DOWN SWITCH	REPLACE DOWN SWITCH CHECK W/METER AND REPLACE
CLAW COMES UP AND ABOUT 15 SEC PASSES BEFORE CRANE MOVES TO THE HOME POSITION	UP SWITCH BAD LOOSE OR DAMAGED HARNESS TO UP SWITCH	REPLACE UP SWITCH CHECK W/MATER AND REPLACE
CRANE OR WAGON WHEELS SLIP	MISSING OR DAMAGED O- RING DRIVE BELTS LOOSE SET SCREWS IN WHEELS LOOSE SET SCREWS IN DRIVE COUPLER RAILS NEED TO BE SCUFFED	REPLACE O-RING BELTS TIGHTEN SET SCREWS TIGHTEN SET SCREWS SCUFF TOP OF RAILS WITH SANDPAPER

QUICK TROUBLESHOOTING

- NOTE: A self test will be performed each time the front door is "closed" or the game is powered up.

- NOTE: The game will not count credits or plush out on either the mechanical or software counters while the front door is open.

- NOTE: If the Wagon does not move smoothly through a full travel from left to right, check to see that the wheel spacing is correct. If the spacing is correct then check the 2 cabinet rails for burrs that may cause the wheels to bind.

- NOTE: If the Crane does not move smoothly through a full travel from front to back, check to see that the wheel spacing is correct. If the spacing is correct then check the 2 separator rails for burrs that may cause the wheels to bind.

- NOTE: If the Micro track for the left right movement is binding during its travel check to see if the top mirror brackets edge, also the shelf the micro track rides on, has been de-burred.

- NOTE: If the front door is having trouble closing fully, check to see that the front light harness is tie wrapped above the highest point of the prize chamber wall. Next check to see that the prize chamber wall is far enough to the right to allow the right edge of the prize door frame to swing past. Finally check to see that the hinge leaf length is short enough to prevent binding in the cabinet door frame.

- NOTE: If the door will not lock properly or locks with difficulty, check to see that the lock rotates smoothly. Next check lock rods are not binding on the lock cam or the lock rod guides. Next check that all friction points have been lubricated with molly grease. Finally if need be, file the lock rod guides such that the door closes and locks smoothly but be careful not to file out to much, for this may cause the door not to pull in tightly to the cabinet as it was intended to do

- NOTE: If the decimals light up on the displays after a self test, an error has been logged. When the door is in the open position, the error codes will be shown on the left display. To advance through the error codes press the drop button.

- NOTE: If, at the beginning of the self test mode, the claw does not drop, one or more of the following may apply. The prize sensor is not working, or is blocked. The string or string lever is mechanically binding. The up or down switch is sticking or misalleged from its actuator.

- NOTE: If claw stays closed it is likely that the diode has blown and the transistor controlling the claw has also blown. Shut off game immediately and have a new diode, in coil assembly, and transistor, on main board, installed. If the capacitors at C16 and C54 exist on the main board, remove them for added protection to the solenoid transistor @ Q10.

- NOTE: If claw is jerky while being lowered, it is likely that the up spring is missing or not properly elongated. Another possibility is that the string has mechanically bound on the spool. To fix the string binding, enter the programming mode and go to mode 24. By moving the joystick to the left and right you are able to raise and lower the claw mechanism. Move the crane over the prize chute and lower the caw mechanism all the way until it starts to wind up backwards. Reverse the motor direction to raise the claw mechanism and properly rewind the string on the spool. Exit the programming mode and the string should be free of mechanical binding.

- NOTE: If the claw stays open first check for bad fuses on the main board, next check that there are no wires dislodged from the connectors in the harness between the wagon and crane, the harness between the wagon and the main board, the crane assembly and the wagon assembly. If the problem still exists and no fuses are blown or wires dislodged it is likely that the transistor controlling voltage to the claw has blown on the main board. Replace main board and have the other main board repaired by electronics.

- NOTE: If the crane/wagon, in the home position, tries to move left or back, check to see that the actuators are both present. Next check to see that the sensors are present. Next check to see that the sensors and actuators are aligned. Then check to see that the sensor wires are not dislodged from the connectors. Finally replace the sensor, it is likely to be bad.

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GAME REPAIR

WARNING: ALWAYS REMOVE POWER FROM THE GAME BEFORE ATTEMPTING ANY SERVICE, UNLESS NEEDED FOR SPECIFIC TESTING. FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN SERIOUS INJURY TO YOURSELF AND/OR OTHERS.

TROUBLESHOOTING PHILOSOPHY

To find problems with the game, always check the obvious first. See that the game is plugged in, and that all of the fuses are good.

Next, check to see that all of the connectors are firmly seated, and that no wires have been pulled out.

When trying to find out if specific components are bad or not, try swapping them with components from another PINNACLE ™ crane game (if available) to see if the problem moves with the component, or stays where it was. This will help you decide if you have a problem with a specific component, or maybe a problem with either the wiring or the main p.c. board. Use extreme caution when using probes or volt meters if the game is powered up. If checking continuity, it is important to disconnect the harnessing at both ends, as attached they may yield erroneous results.

If a p.c. board is suspected as causing your problems, check to see that all of the I.C. chips are firmly seated on the board.

MAIN P.C. BOARD REPLACEMENT

1. Remove all A.C power from the game.

2. Unlock and open front door.

3. Carefully remove all of the connectors from the main p.c. board.

4. Remove the 4 long plastic hexagon nuts that secure the board to the main board housing.

5. Gently pull the p.c. board from the mounting studs.

6. Reassemble in the reverse order using a new main p.c. board.

FRONT GLASS REPLACEMENT

1. Remove all A.C power from the game.

2. Remove the (3) 10-24 carriage bolts holding the top glass frame in place. .

3. Loosen the (5) 1/4-20 kep nuts holding each side glass retainer in place and slide retainers back.

4. Loosen and remove the (3) self taping screws holding the bottom glass retainer/ window valence in place.

5. If the glass is broken, be sure to remove all pieces from where the new glass will rest.

6. With proper ceiling height, slide the new glass in from the top. NOTE: Be careful to properly align the glass with the side channels to prevent breakage.

7. When glass is properly seated, slide the side glass retainers into place and tighten the (5) 1/4-20 kep nuts for each side.

8. Re - install the bottom glass retainer and tighten into place via. the (3) self taping screws.

9. Reinstall the top window frame and tighten into place via. the (3) 10-24 carriage bolts.

SIDE GLASS REPLACEMENT

1. Remove all A.C. power form the game.

2. Remove wagon and crane assemblies.

3. Remove front and rear cabinet rails and hardware.

4. Remove fluorescent lights and brackets on side where glass is to be replaced.

5. Remove (2) side window retainers and (1) top window retainer.

6. Remove side marquee.

7. Back out long 1/4-20 bolts that hold on the side window retainers so they are flush with the 1" tube frame.

8. Remove bolts holding playfield in place near bottom of the glass.

9. Install new glass from the inside of the game and drop into channel in the playfield.

10. Reinstall retainers, lights , brackets, marquee, playfield bolts and rails in reverse order.

PLUSH RETAINER/WALL REPLACEMENT

1. Remove all A.C power from the game.

2. Unlock and open front door.

3. Carefully remove the (2) 1/4-20 nuts holding the plastic plush retainer/wall, to the side of the game.

4. Remove old plastic plush retainer wall.

5. Reassemble in reverse order using new plastic plush retainer wall.

REMOVAL OF CRANE MECHANISM

1. Remove all A.C power from the game.

2. Unlock and open the front door.

3. Slide the crane assembly to the front center of the crane.

4. Loosen black thumb screw securing the front to back micro track bracket in place. The thumb screw is located on the front face of the crane assembly nearest the door.

5. Slide the micro track bracket forward and up to disconnect it from the crane assembly.

6. Carefully lift the entire crane assembly off the rails approximately 2 inches, shift to the left as far as possible, drop the right side down past the right crane rail and slide the entire assembly out from between the two separator rails.

7. The crane assembly can now be removed from the cabinet so necessary maintenance / repairs can be made.

8. Reassemble in reverse order.

REMOVAL OF WAGON MECHANISM

1. Remove all A.C power from the game.

2. Unlock and open the front door.

3. Remove crane assembly as detailed above.

4. Loosen black thumb screw securing the micro track bracket in place. The thumb screw is located on the upper right face of the wagon assembly.

5. Slide the micro track bracket to the right and up to disconnect it from the wagon assembly.

6. Carefully lift the entire wagon assembly off the rails and rotate clockwise until the left front wheel clears the front rail.

7. Lower the front of the wagon assembly and remove the assembly from between the two rails.

8. The wagon assembly can now be removed from the cabinet so necessary maintenance / repairs can be made.

9. Re - assemble in reverse order.

PRIZE SENSOR REPLACEMENT

1. Remove all A.C power from the game.

2. Unlock and open front door.

3. Remove the connector from the prize sensor board.

4. Remove the 2 bolts holding the prize sensor bracket to the playfield and remove the prizes sensor and bracket from the game.

5. Remove the 2 plastic hexagonal nuts securing the sensor board to the bracket.

6. Carefully remove the sensor board from its mounting studs.

7. Re - assemble in reverse order using a new prize sensor board.

STRING REPLACEMENT

1. Remove all A.C power from the game.

2. Unlock and open front door.

3. Remove crane assembly as detailed above.

4. Disconnect the claw assembly from the crane assembly by remove the two bolts securing the aluminum coil cap to the coil housing.

5. Tie a knot at the end of the replacement string. Use super glue to prevent the knot from working loose or use a lighter to melt the knot to prevent loosening.

6. Using a lighter, melt the other end of the string and form a point before it completely cools.

7. Feed the pointed string end up through the hole in the coil cap and pull until the knot is firmly seated on the inside of the cap. SEE CRANE ASSEMBLY DRAWING

8. Feed the pointed end up through the hole in the bottom of the crane assembly housing.

9. Feed string over first string guide then under the next string guide.

10. Finally feed the string through the hole in the side of the string spool, attached to the motor shaft, and tie another knot. (Once again either use super glue to prevent the knot from working loose or use a lighter to melt the knot to prevent loosening)

11. The string is now properly strung.

12. Re - attach the claw assembly to the crane assembly using the two bolts that were removed in step 4

13. Re- install the crane assembly into the game and set it in the home position with the claw assembly hanging in the prize chute.

14. Turn on game and the crane will automatically rewind the string properly.

MOTOR REPLACEMENT

1. Remove all A.C power from the game.

2. Unlock and open front door.

3. Remove crane and or wagon assembly as detailed above. NOTE: What is removed depends on which motor has gone bad.

4. Loosen two thumb screws securing crane housing cap in place and remove. NOTE: This step is only for the 2 motors in the crane assembly.

5. Remove drive o-rings and wheels from bad motor.

6. De - solder the motor leads from the bad motor. NOTE: Be sure to note which wire goes to which motor lead, for if they are re - installed backwards the motor will run opposite of its intended direction.

7. Carefully remove bronze bushing supporting the motor shaft of the bad motor. NOTE: This step is only for the 2 motors in the crane assembly.

8. Remove the 4 bolts securing the motor to the housing.

9. Carefully remove the bad motor.

10. Re - assemble in reverse order using new motor. NOTE: When Motor is completely re - installed, place one drop of thread lock on each of the 4 bolts that secure the motor in place to prevent the bolts from backing out.

FUSE REPLACEMENT

CAUTION FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH THE SAME TYPE OF FUSE HAVING THE SAME ELECTRICAL RATING.

AREA	LOCATION	AMP	VOLT
MAIN BOARD	F2	6 MDQ	250
	F3	3 MDQ	250
	F4	4 MDQ	250
	F5	4 MDQ	250
POWER MOD	--	3 MDQ	250

CORD REPLACEMENT

IF THE SUPPLY CORD IS DAMAGED, IT MUST BE REPLACED BY THE MANUFACTURER OR ITS SERVICE AGENT OR A SIMILARLY QUALIFIED PERSON IN ORDER TO AVOID A HAZARD.

I.C.E. Quick Reference Install Manual

This is a short amendment to the Pinnacle crane manual that comes with every crane, it's purpose is to paraphrase and highlight some key points of the crane, it's parts, and programming, to make installation, service, and maintenance of the machine a little easier for those of us who have never seen one. **It is not however a substitute for reading the manual. It'll help – Honest.**

RECEIVING

- Your crane was shipped to you from Innovative Concepts in Entertainment, in a large box that has been lag bolted to a skid. Inspect this box and pallet for signs of damage. **DO NOT ACCEPT ANY EQUIPMENT THAT ARRIVES IN A DAMAGED CARTON WITHOUT UNPACKING ANI INSPECTING THE MACHINE FOR DAMAGE FIRST !!!**
- Remove the box by cutting along the bottom just above the skid, and lifting the box up and off of the crane. At this point you'll notice your crane is sitting up about an inch off the wheels, that's because there are four 4x4 blocks of wood holding the machine off of the pallet.
- Removal of the shipping blocks is at least two-person job. One person will need to tilt the unboxed crane slightly to one side while another person removes the shipping blocks two at a time. With that done carefully roll your crane off of the pallet.

UNPACKING

- I.C.E. has shipped your crane with the keys cable tied to the joystick, use a pair of diagonal cutters to remove the cable tie and open the door. Once the door is open you'll notice that the transport and bridge have been secured with way too many cable ties. Remove all cable ties from the transport and bridge. **Being very careful not to cut any belts or wires.**
- After freeing the bridge and transport, locate the main power cord on the floor of the machine and feed it through the hole in the crane floor and plug it in.

TESTING

Money, Game Credits, and Meter Clicks

Your pinnacle crane was shipped to you with the ability to accept quarters, dollar coins, dollar bills, five-dollar bills (old and new), and ten-dollar bills. Thoroughly test your crane for proper acceptance, correct coin to credit ratio, and number of "clicks" on the mechanical coin meter. It should be one "click" per coin on the quarter coin mech, 4 "clicks" per coin on the dollar coin mech, 4 clicks for a Dollar Bill, and 20 clicks for a $5.00 bill.

The A.C.M.I. regional V.P.'s has predetermined claw size and the crane you have received will have either a jumbo claw or a large claw. To determine which claw you have you need to examine the claw fingers. If there are only two holes in the claw finger (one hole for the pivot point, one hole for the fulcrum) then it's a jumbo claw. If you see three holes in the claw fingers (one for the pivot point two holes for the fulcrum) then you have a large claw. Different parts of the country have different laws concerning claw size and configuration so it is very important to know exactly what it is you're looking at.

ADJUSTMENTS

Some of the factory default game settings will need to be changed depending on the decisions made by you regional management team and the laws in your area. Here is a list of some of the important options:

- Claw Strength
- "Normal" play or Drop and Drag (Nudge)
- Claw centering
- Claw Snap

The Claw

- **First the mechanical check:**
  - Manually depress the Claw Spider (where the ends of the fingers attach to together) and hold i fully closed. You should have no more than the diameter of a "Dime" between the tips of the fingers. They can just about touch. To adjust, loosen the three Phillips screws on the collar and move the ring up or down slightly to get this adjustment.
  - **NOTE:** ***Moving the claw slide just (1/8th) of an inch makes a big difference at the tips of the Claw. You don't want the tips to touch and you don't want them to be further apart than a dime.***
  - While you have the claw in your hand, lets check out the linkage. All of the small screws and nut that hold the assembly together need to have some side to side play in them so that the claw won' bind. It's a quick and easy check to assure that there is no binding. Wiggle each arm at each join to make sure that the joint is not too tight. That's just 9 joints to wiggle, no sweat. **DO NOT USI ANY SORT OF LUBRICANT ON THESE JOINTS; it will gum up the works!**

- **The Software Setting:**
  - The Claw strength is set through the machine's software settings. There is a range of 40 to 99 in position "08", with 70 being the default setting.
  - For the California games, they are factory set @ "65". All other local area laws must be considered. Our testing has found that when running a standard size fill the claw strengtl adjustment needs to be adjusted to a new setting of "65".
    - To do this, open the service door and locate the "ACCT" and "PROG" buttons just inside the service access and to the left.
    - With the door interlock switch (located on the floor of the machine directly below the coin meter) **in the neutral position,** press the "PROG" button. The display will read Pr on botl the left and right side displays. On the 42" models don't close the door when you go around to the front or you will cancel the programming mode.
    - Move the joystick up or down to progress through the programming steps. To set the clav strength, stop when the display on the left reads "08"
    - Now move the joystick to the left (to Lower the number) or right to increase the number until the display on the right reads "65". Press the claw drop button to return the game to normal play mode.

SOME OTHER PROGRAMMING SETTINGS

The programming process that you just used to change the claw strength can also be used to modify othe programmable areas. Lets see how it's done:

"NORMAL" PLAY OR "DROP AND DRAG" (NUDGE) PLAY

Program Mode "0" is the "Game Type" program. Take a minute to check out page 9 & 10 in your manual for a description of the different game types. Using the same steps as you did when setting the claw strength, Get into the Programming Mode, select the "Mode" number by moving the stick forward or backwards and read out the position on the left side display. Get to "0" on the left and you can then enter your options.

- **"Normal"** play (setting "01" in the right display) is when the claw only drops once and it goes all the way to the plush level and closes. There is no incremental drop of the claw at different levels.
- The **"Nudge"** or "Drop and Drag" feature (Setting "00" in the right display) allows the claw to drop and still be moved with the joystick. You do this by pressing the claw drop button and stopping at the desired height above the plush pieces.
- Once you have determined which game mode you wand you move the joystick side to side to change the number on the "Right hand Display". Press the claw drop button save the setting and return the game normal play mode.

CLAW CENTERING

With these settings you can keep the crane from centering after coin in and thus speed up the play.

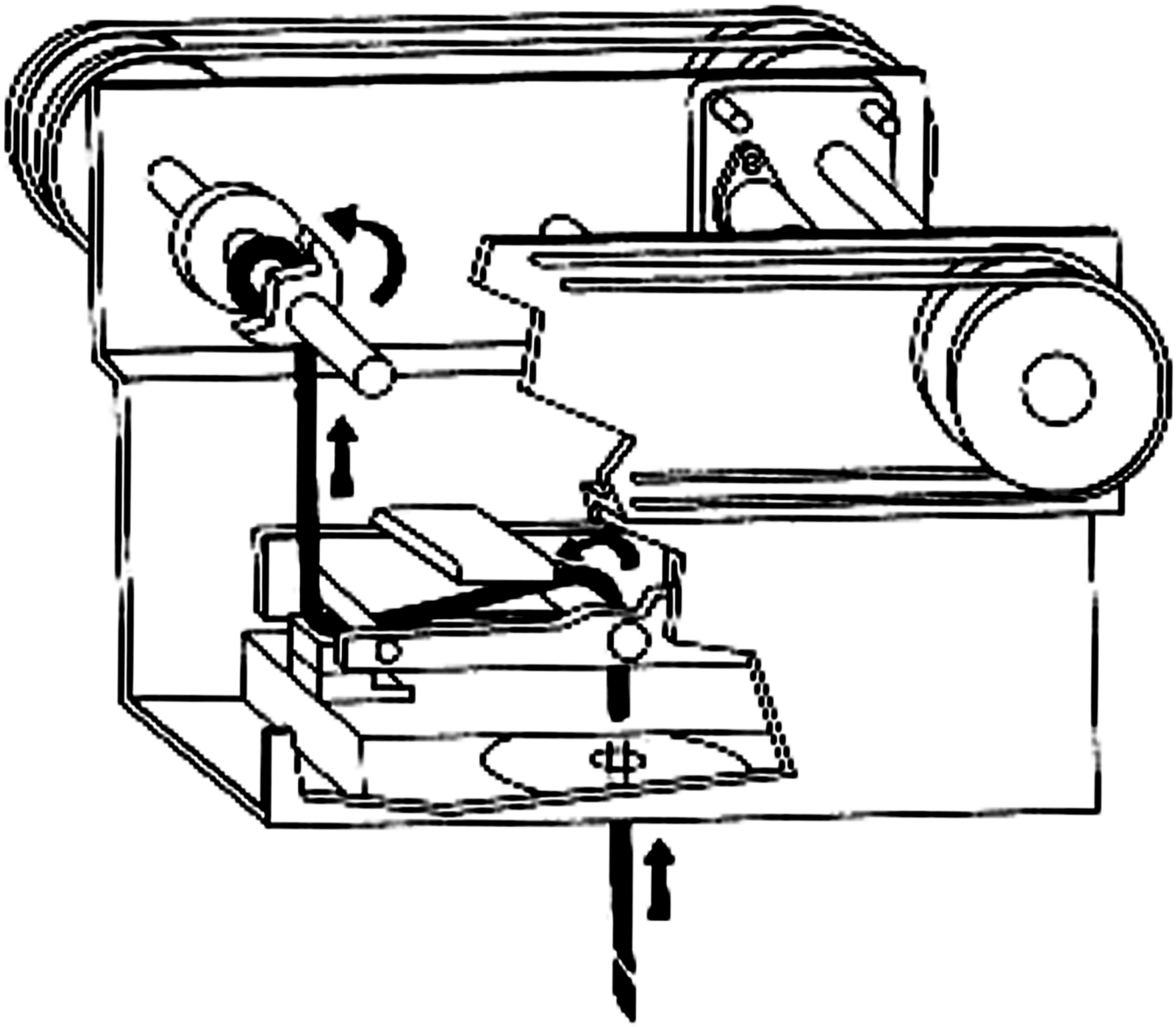
- You can enter the program mode again by pressing and releasing the "PROG" button, and move the joystick up until the display on the left reads **"14"**, now move the joystick to the left until the display on the right reads **"0".**
- After changing the value of step "14", move the joystick up one until the display on the left reads **"15"** now move the joystick to the left until the display on the right reads **"0"**.
- Press the claw drop button to save the setting and return the game to normal play mode.

CLAW SNAP

Claw Snap during attract mode and at the beginning of play can cause undue wear on powder coated Clav fingers.

- Enter the program mode by pressing and releasing the "PROG" button and move the joystick down unti the display on the left reads **22.**
- Now move the joystick to the right until the display on the right reads **0.**
- Press the claw drop button to return the game to normal play mode.

STRING ROUTING DIAGRAM



ICE Crane String Wear Retrofit

Condition: The string was worn and needs to be replaced and we want to stop it from fraying so quickly in the future.

Tools needed: A 3/32 Allen wrench, Crazy Glue or Super Glue, Crazy Glue remover

1. Remove the cover to the crane head assembly and position it so that the string take-up shaft and spool is closest to us. This will position the knot of the string to your left. Pull the string until it is completely unwound. Replace the string with a new one, preferably one identical to the original from ICE. The string needs to be 41 ½ inches long to leave room for the knots that are needed at both ends. Tie a tight knot in the end that will remain at the spool end and glue or burn the end so that it can't unravel. ***If it unravels then the claw assembly can go down the chute and someone will get an extra prize worth big bucks!*** The Crazy glue is what they use at ICE. Get the stuff that takes less than 5 minutes to dry.

   *Again, please be careful not to get **you, the glue** and **something** you don't want to become **one** with, glued together.* The hardware stores sell Crazy Glue remover or you can pick up Acetone based fingernail polish remover in the supermarket or department store. It works just as well.

2. While the glue is drying, take a look at the take-up assembly before you. You have 2 discs that each have 2 holes in them for the setscrews. They should be positioned, so that the setscrews will tighten down on the 2 flat areas (or notches) in the shaft. **It is this notch, on the right hand side, that is causing the fraying problem.**

3. What you need to do is to reposition the right hand disc in so that it will ***just cover*** the notch in the shaft. You need to loosen the set screws on the right disc just enough to move it about a 1/8" to the left. When you tighten the screws back down. Be sure that you are still aligned so that the screws are in the flat area on the shaft and that you can't see any of the notch inside the spool where the string will be. **(see Figure 1)**

4. This is a good time to assure that the setscrews on the left hand disc are tight and positioned over the flat areas of the shaft. This side does not have to completely cover the flat area, so you just want to check that the screws are tight and that you have about 5/8s of and inch between the discs. This will assure that you have plenty of room between the spools to take up all the string.

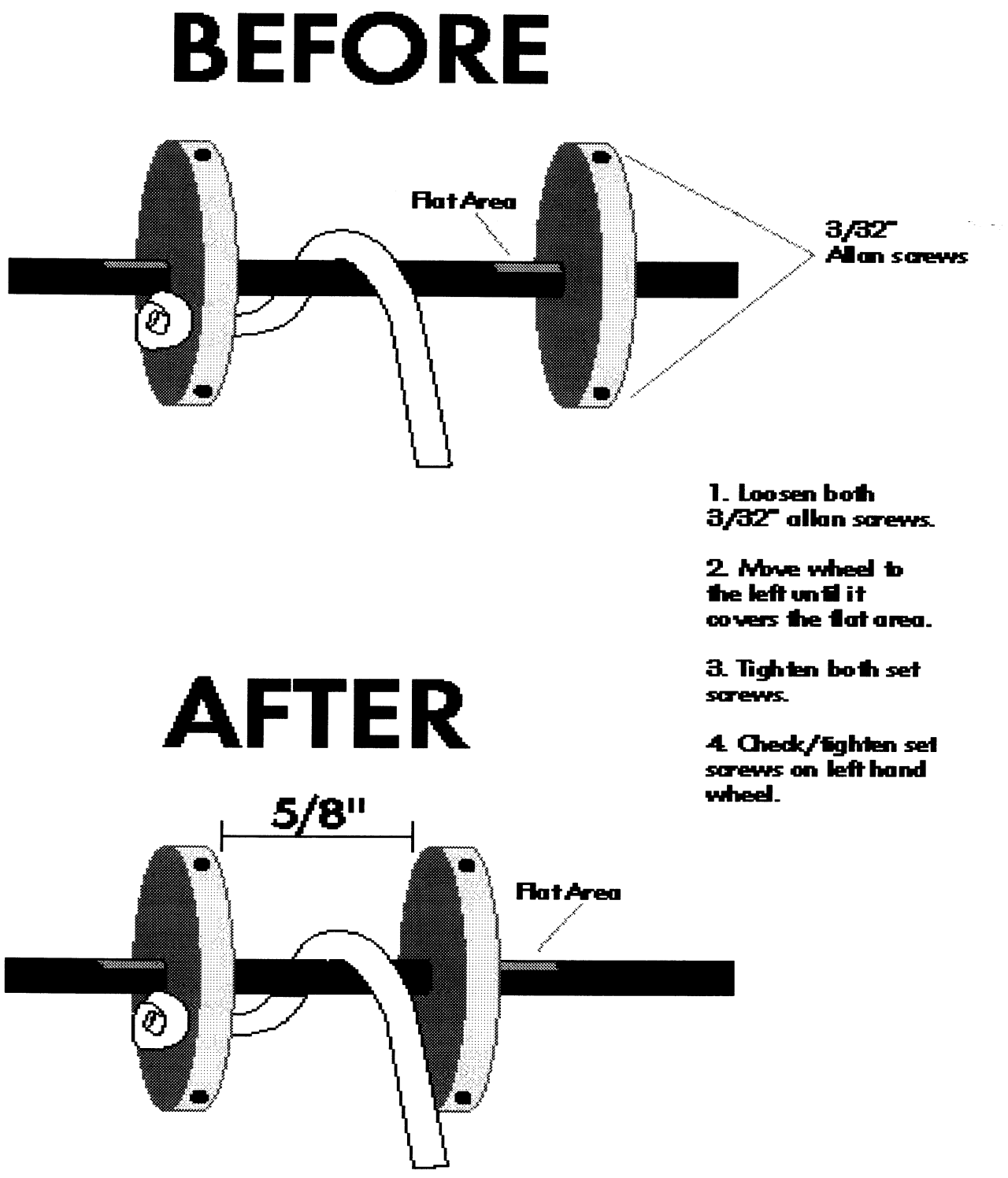
5. Thread the string from the left through the hole on the left hand disc and then follow the directions on the crane head cover.

6. Attach the other end of the string to the coil cap and tie a tight knot in the end. Once again use the super glue to make sure that the knot will not come out.

7. Once the machine is in operation be sure to check all its functions by putting the game through its paces.

8. Before you leave be sure to record the meter read and the fact that you have set the take-up spool dimension to 5/8". This will tell us how long the string lasts from now on. (See figure #1 on the next page)

Figure 1.


BEFORE
Flat Area
3/32"
Allan screws
1. Loosen both 3/32" allan screws.
2. Move wheel to the left until it covers the flat area.
3. Tighten both set screws.
4. Check/tighten set screws on left hand wheel.
AFTER
5/8"
Flat Area

Motor Binding Problems

We have come across a very important piece of information that needs to be followed when replacing a motor on an I.C.E. Carriage or shuttle assembly.

The main consideration is to be sure that you do not over-tighten the screws that hold the motors in. We were tightening one in the lab with power applied to the motor and we noticed that you can really affect the speed of the motor when you tighten the screws down too much. This is because you warp the gear case and bind the gears.

So how much is too tight?

First get a tube of " Lock-Tight" in any good auto supply store. It's used to help keep nuts and bolts from loosening up on cars. It comes in 2 strengths so make sure that you get the "BLUS" type for this application.

Tighten the two screws into the motor just enough to eliminate any movement of the motor assembly. Then place 2 drops of the Blue Lock Tight on the end of the screw and let it dry. That should take care of it.

EPROM Replacement on the ICE 42" and 60" Cranes
6-20-01

The General Manager needs to perform this procedure. The EPROM that needs to be replaced is **U6**. It is the only EPROM on the board, and one of only two that are on sockets so that they can be removed without de-soldering. You will see a label on the chip that is on the board. The chips you will receive will also have labels and they are designated to be for 42" or 60" machines.

All States EXCEPT California. The chips will be as follows:

Type of Machine	Chip already in Machine	Replace it with
60 " machines	**SLU6 4.51 60 ***	**SLU6 4.60 60**
42" machines	**SLU6 4.51 42 ***	**SLU6 4.60 42**

For Games in California The chips will be as follows:

Type of Machine	Chip already in Machine	Replace it with
60 " machines	**SLU6 4.51 60 C ***	**SLU6 4.60 60 C**
42" machines	**SLU6 4.51 42 C ***	**SLU6 4.60 42 C**

* You might find cases where the number on the chip that is in the machine is different (lower) than 4.51. This is OK. It is important that you match the 60 with a 60 and a 42 with a 42, and **that the chip you put in the game is a 4.60.**

If the chips you get don't match what you need please give us a call here at SMILE.

Please Note:

I would carry an ICE Crane manual, tools and a good flashlight with you. This is just in case you run into other problems. The swapping out of this chip should not cause any problems. It is just a good idea to have these things on hand if you need them.

To replace the EPROM:

- Tools required
- An EPROM Removal tool. One will be supplied to each office
- Or you can use a small adjusting Screw Driver, 1/8" flat blade
- Time required (with Care)
    - The first one about 10 - 15 minutes
    - After that 5 - 10 minutes
- Turn off the power at the main power switch.
- Before you touch any of the components on the board, it's always a good idea to ground yourself and discharge any static electricity you might have on you. You do this by touching a piece of the metal frame of the machine, just before you touch the logic board.

- On the board locate "U6"; it will have a paper label similar to the one you are going to replace it with. **Be sure to note the position of the small half moon indent on one end of the chip**, so that you can position the new chip the same way. *It is this half moon indent on the chip that determines proper placement,* ***NOT the way the label reads.*** *I have found some labels that are oriented one way and some that are the other.*
- Use the EPROM removal tool to grab both **ends** of the chip and gently pull away from the board in a rocking motion, straight out. Be careful not to bend the pins on the chip. Or if you prefer using the screwdriver, gently place the tip your small adjusting 1/8" screwdriver blade between the chip and the chip socket under one of the long ends of the chip. *Look at the thickness of the chip you have brought to replace. You want to go between the bottom of the chip and the top of the chip socket. Gently pry up a little on the one edge. Then go* to the other edge of the chip and do the same. Do this a few times, each time gaining a little so that you don't bend any of the pins.
- Check the chip you are about to install to make sure that it is the right one for the game and carefully align the pins to the holes in the socket. Insert the chip remembering where the Half moon indent is. *On the 42" the Half moon indent goes to the rear of machine. On the 60" it goes toward the front. If in doubt, you can look on the chip socket and the half moon indent will be on the socket.* **It is important to make sure that all the pins are properly seated in the chip socket.**
- Place the old chip in the antistatic bag or tube it came in and **make sure it gets back to Tech. Services. All of the old chips must be returned to us here at SMILE.**
- Turn the power back on and test the machine for proper operation of all game functions.
- Be sure to check that the meter now clicks when you coin it up from both of the coin mechs and that it registers correctly when you insert a bill in the DBA. **This needs to be checked with the door interlock switch in the open position and with the door interlock switch in the closed positions**.
- **California Machines Only -** Check to see that in programming mode # 8 you can't change the adjustment of the Claw Strength. Also, be sure that Mode #9 is in the off setting.
- **Please note that merchandisers will now have to record <u>All</u> test play credits that are used to check out the game.**

NEW "ICE" CRANE INSTALL CHECKLIST

- ❑ Cut and remove all cable ties from the Bridge, Transport, and coin bucket area.
- ❑ Remove the Machine Manual & any paperwork from the Coin Bucket.
- ❑ Check the various Nuts, Bolts, and Screws on the door, the machine casters, and in the playfield area for tightness.
- ❑ Check the take-up spool sides and make sure that the flat area on the shaft is covered by the right take-up spool side. (see, "ICE string fix instructions" on the "I" drive for full details)
- ❑ Check the space between the Claw fingers when the solenoid is fully depressed. It should be the size of a dime or less.
- ❑ Check and make changes as needed to the programming modes: **(as read off the Credit display)**

	Mode	Description		Desired Set
❑	Mode 0	NUDGE FEATURE		Set position 0 @ 0
❑	Mode 0	NO NUDGE FEATURE		Set position 0 @ 1
❑	Mode 9	AUTO CLAW STRENGTH		Set position to "0"
❑	Modes 14 & 15	CLAW CENTERING	OFF	**Set both 14 & 15 @ 0**
❑	Mode 22	CLAW SNAP	OFF	**Set position 22 @ 0**

Test the DBA and Coin Mech's for proper operation and the meter for the proper clicks:

□ 1 Click for a Quarter □ 4 Clicks for a Dollar Bill
□ 4 Clicks for a Dollar Coin □ 20 Clicks for a five (new & Old style)

Test Play the game thoroughly using some of the coined up credits.

□ RIGHT □ LEFT □ BACKWARD □ FORWARD □ DROP □ CLOSE

- ❑ **Record the Serial # on a Blank Label and place it in the bottom of the machine.**
- ❑ **Calendar book filled in with Location Information.**
- ❑ **Install "FOR SERVICE CALL" sticker on the lower inside of the left window.**
- ❑ **"50 CENTS TO PLAY" taped on lower right window**
- ❑ **Lock Core for route assignment installed in "T" handle**
- ❑ **Add Product to game. (42"= 60 pieces, 60"= 75-85 pieces) (Fill is dependent on mgt. decisions.)**
- ❑ **Record the information in the calendar book.**
- ❑ **"5-STAR" installation packet in front of machine, with unit number listed.**
- ❑ **Serial # and Location recorded on office install form.**

Completed by:_____ Date:_____

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CD RN Autoplay Set-Up

With the machine on and in SERVICE MODE:

On the keypad, press 4 - this will put you in the AUTOPLAY section of the SERVICE MODE.

On the keypad, press 0 - this will put you in the AUTOPLAY IS subsection.

On the keypad, press and hold the Reset button and press the 9 until the display reads "AUTOPLAY IS STD". *

* STD will put the box in "Standard" Autoplay mode, this setting will be used for all installations not required to play an advertising feature or song. By scrolling, Autoplay may be set to "AUTOPLAY IS ADS" for locations having advertising features and/or songs. Refer to separate instructions about this features programming

On the keypad, press Popular - this will save your settings.

On the keypad, press Reset and Popular together repeatedly until the display reads "SERVICE MODE".

On the keypad, press 4 - this will put you in the AUTOPLAY section of the SERVICE MODE.

On the keypad, press 1 - this will put you in the DELAY TIME subsection.

> Time will be entered in minutes as three digits; i.e. 0,0,4 for four minutes / 0,1,0 for ten minutes / 1,2,0 for two hours / etc...

Using ten minutes as the prescribed default Autiplay Time:

On the keypad, press 0.

On the keypad, press 1.

On the keypad, press 0.

On the keypad, press Popular - this will save your settings.

On the keypad, press Reset and Popular together repeatedly until the display reads "SERVICE MODE".

Closing the Cabinet Door returns the juke to Normal operation.

CD RN ADV Setup

With the machine on and NORM / SERVICE slide switch set to SERVICE:
Place the Denny's Dance Disk in slot 51.
[the CANCEL Pushbutton inside near the coin meter may be used to move the carousel wheel into position]
On the keypad, press 3 - this will put you in the INITIALIZE section of the SERVICE MODE.
On the keypad, press 1 - this will put you in the PROGRAM INIT subsection.
On the keypad, press 5 - press 1 - this will select the disk to initialize.
On the keypad, press Popular - this will save your settings.
Move the NORM / SERVICE slide switch to NORM - the CD mechanism will find disk 51, place it on the player and spin it for several seconds, then return it to slot 51.
Move the NORM / SERVICE slide switch to SERVICE.
On the keypad, press 4 - this will put you in the AUTOPLAY section of the SERVICE MODE.
On the keypad, press 0 - this will put you in the AUTOPLAY IS .... subsection.
On the keypad, press and hold the Reset button and press the 9 until the display reads "AUTOPLAY IS ADS". *

* ADS will put the box in "ADVERTISING" AutoPlay mode, this setting will be used for all installations required to play an advertising feature or dance songs. By scrolling, AutoPlay may be set to "AUTOPLAY IS STD" for locations not requiring timed advertising features and/or songs. Refer to the Rowe CD-RN Quick Guide about standard AutoPlay programming.

On the keypad, press Popular - this will save your settings.
On the keypad, press Reset and Popular together repeatedly until the display reads "SERVICE MODE".
On the keypad, press 4 - this will put you in the AUTOPLAY section of the SERVICE MODE.
On the keypad, press 1 - this will put you in the DELAY TIME subsection.
> Time will be entered in minutes as three digits; i.e. 0,3,0 for thirty minutes / 1,2,0 for two hours / etc...
Using thirty minutes as the prescribed Advertising Time:
On the keypad, press 0 - press - 3 - press 0.
On the keypad, press Popular - this will save your setting.
On the keypad, press Reset and Popular together repeatedly until the display reads "SERVICE MODE".
On the keypad, press 4 - this will put you in the AUTOPLAY section of the SERVICE MODE.
On the keypad, press 5 - this will put you in the PROGRAM INIT subsection.
The display should now read "*PROGRAM 00* - - - -", if it does - skip to **>>** below.

A number appearing to the right of "PROGRAM 0x xxxx" indicates previous ADS selections have been set. On the keypad, press and hold the Reset button and repeatedly press the 4 until the display reads :
"*PROGRAM 00* - - - -" and is changing back and forth to "*PROGRAM 00* - - - _"
On the keypad, again press Reset and Popular together repeatedly until the display reads "SERVICE MODE".
On the keypad, press 4 - this will put you in the AUTOPLAY section of the SERVICE MODE.
On the keypad, press 5 - this will put you in the PROGRAM INIT subsection.

>> On the keypad, press 0 - press 0 - this will allow selection of the disk and first advertising track.
On the keypad, press Popular - this will save your setting.
The display will now read "*PROGRAM 00* - - - -" and change back and forth to "*PROGRAM 00* - - - _"
On the keypad, press 5 - press 1 - press 0 - press 1 - this will select the disk and first advertising track.
The display will now read "*PROGRAM 00* 5101"
On the keypad, press Popular - this will save your setting for ADS selection #1.
The display will now read "*PROGRAM 01* - - - -" and change back and forth to "*PROGRAM 01* - - - _"
Continuing; On the keypad, press 5 - press 1 - press 0 - press 2 - this will select the disk and second advertising track.
The display will now read "*PROGRAM 01* 5102"
On the keypad, press Popular - this will save your setting for ADS selection #2.
The display will now read "*PROGRAM 02* - - - -"

[These steps are to be repeated for as many songs as the local Denny's store manager or Area manager have requested, otherwise skip to the next line]

On the keypad, press Reset and Popular together repeatedly until the display reads "SERVICE MODE".
On the keypad, press 4 - this will put you in the AUTOPLAY section of the SERVICE MODE.
On the keypad, press 7 - this will put you in the APLAY STATUS subsection.
On the keypad, press and hold the Reset button and press the 9 until the display reads "APLAY IS ON". *
On the keypad, press Popular - this will save your setting.
Closing the Cabinet Door returns the juke to Normal operation.

Now the Jukebox is setup to play the ADS selections. The ADS selection will play at the approx. minute mark as programmed above. If the juke is playing a paid selection when the ADS time set above comes due, the ADS selection will play immediately following the paid selection.

CD RN Song Lockout

With the machine on and in SERVICE MODE:

On the keypad, press 6 - this will put you in the OPTION mode.

On the keypad, press 0 - this will put you in the LOCKOUTS subsection.

IF the display reads "LOCKOUTS 00 - - - -", skip to **>>** below.

A number appearing to the right of "LOCKOUTS 00 xxxx" indicates previous lockouts have been set. Housekeeping practice makes it a good idea to clear all previous lockouts. Make note of any locked-out selection to be kept for reprogramming.

On the keypad, press and hold the Reset button and repeatly press the 4 until the display reads :

"LOCKOUTS 00 - - - -".

On the keypad, again press Reset and Popular together repeatedly until the display reads "SERVICE MODE".

On the keypad, press 6 - this will put you in the OPTION mode.

On the keypad, press 0 - this will put you in the LOCKOUTS subsection.

>> On the keypad, press 0.

On the keypad, press 0 .

On the keypad, press Popular.

Now as an example; if we are locking out the infamous Jimmy Buffet *Lets Get Drunk* song on track 09, and if this disk is in slot 06:

On the keypad, press 0 - press 6 - press 0 - press 9 - this will select the disk and track to lockout.

On the keypad, press Popular - this will save your setting for lockout selection #1.

The display will now read "LOCKOUTS 01 - - - -"

Continuing the example; we are locking out Eric Claptons *Cocaine* song on track 06, and the disk is in slot 42:

On the keypad, press 4 - press 2 - press 0 - press 6 - this will select the disk and track to lockout.

On the keypad, press Popular - this will save your setting for lockout selection #2.

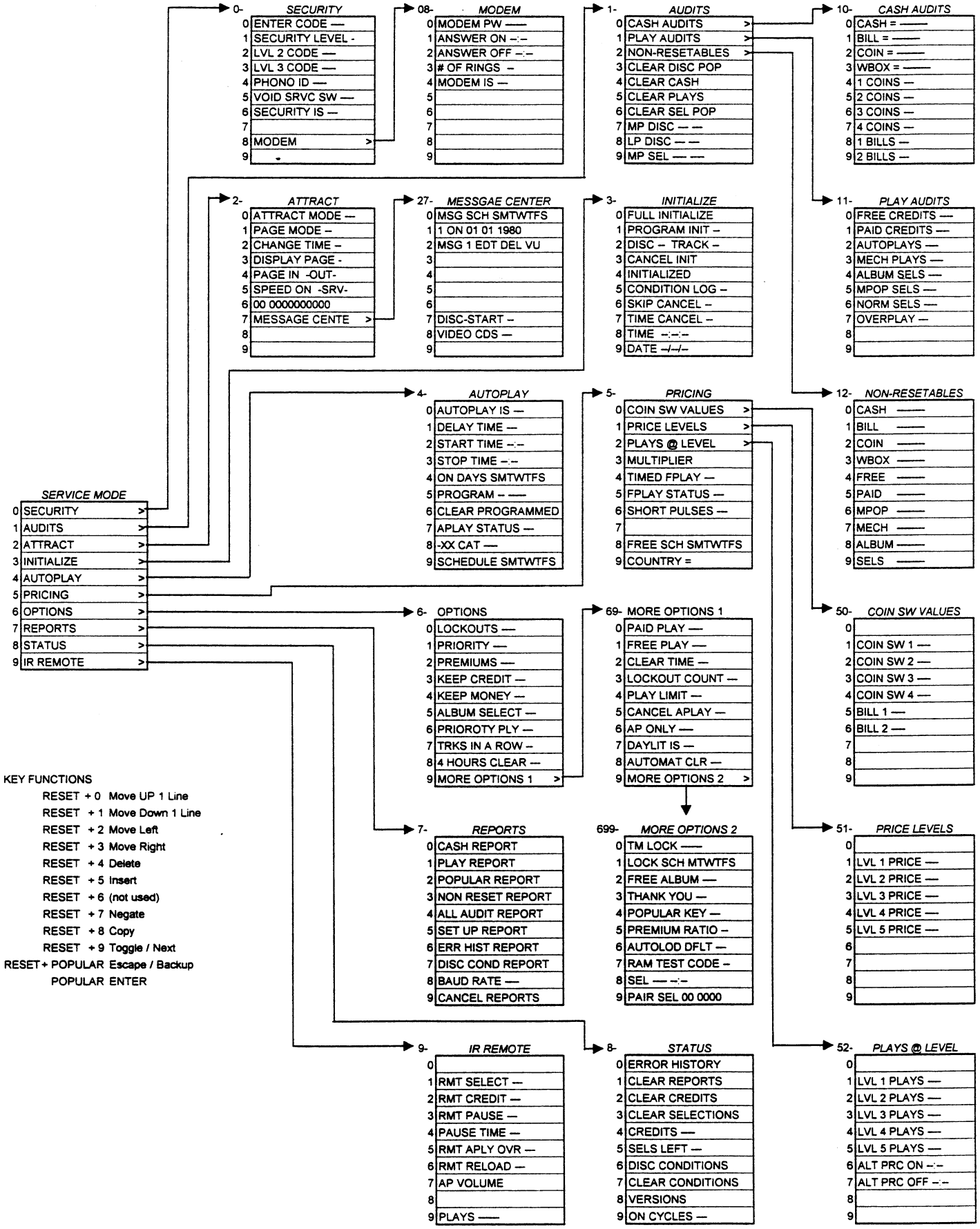
The display will now read "LOCKOUTS 02 - - - -" .....

[These steps may be repeated for as many songs as there are to lockout, otherwise skip to the next line]

On the keypad, press Reset and Popular together repeatedly until the display reads "SERVICE MODE".

Closing the Cabinet Door returns the juke to Normal operation.

Rowe CD-RN Jukebox



KEY FUNCTIONS

RESET + 0 Move UP 1 Line
RESET + 1 Move Down 1 Line
RESET + 2 Move Left
RESET + 3 Move Right
RESET + 4 Delete
RESET + 5 Insert
RESET + 6 (not used)
RESET + 7 Negate
RESET + 8 Copy
RESET + 9 Toggle / Next
RESET + POPULAR Escape / Backup
POPULAR ENTER

ROCK-OLA QUICK FIND REFERENCE PROGRAMMING

For quick programming, from the SETUP MODE enter the 2 or 3 digit number then push the HITS button.

DISC MAPPING
10 Map
11 Track Lockouts
12 Disc Lockouts
13 Special Discs
14 Auto Remap
15 View Track Lockouts
16 Clear Track Lockouts
17 View Disc Lockouts
18 Clear Disc Lockouts
19 View Specials
20 Clear Specials

PAGE OPTIONS
25 Pages
26 Set Last Page
27 Set Home Page
28 Home Delay
29 Remote Pages

PLAY OPTIONS
30 Track Limit
31 Track Time
32 Album Select
33 Play Order
34 Skip Count
35 Bd Track Lock
36 Bd Disc Lock
37 Clear Select Time
38 Clear Credit Time
39 Priority Dsc

AUTOPLAY
40 Auto Play
41 Background
42 Aux. Backgrnd
43 Background Vol.
44 End Style
45 Hits Button

FREE PLAY
50 Free Play
51 Clear Free
52 Password FP
53 Free Special
54 Free Albums
55 Remote Credit

PRICING
60 Unit Price
61 Input Rates
62 Pricing Levels
63 Credits Spec.
64 Recirculate Lv.
65 Acct. Unit
66 Timed Bonus

SET-UP 1
70 Suspend Plays
71 Serv. Credits
72 Clear Selections
73 Clear Credits
74 Set Clock/Date
75 Message
76 Scroll Rate
77 Auto Clean
78 Volume Range
79 Vol Bridge

SET-UP 2
80 Password 1
81 Password 2
82 Password 3
83 Serial Num
84 Print Menus
85 Service Record
86 Counter Out
87 Factory Reset
88 Language
89 Start Style

ACCOUNTING
90 Last Reset
91 Print Acc. Data
92 Basic acct.
93 Total Acct.
94 Clear PTD's
95 View Level 1
96 SP in Ratio
97 Power Cycles

POPULARITY
100 Last Reset
101 View CD Order
102 Print Popularity
103 View Pop. Data
104 Clear Pop. Data

DISC ERRORS
110 View By Order
111 Print Errors
112 Playing Errors
113 Locked Tracks
114 Missing Discs
115 Clear Errors

REMOTE CONTROL
120 Pause/Mute
121 Select Type
122 Rem Playlist
123 Surround Snd
124 Album Select
125 Cancel Disc
126 Clear Mem.
127 Random Sel.
128 Background
129 Play Lists

TEST MODE
130 View Errors
131 View CPU Tests
132 Run Keybrd. Test
133 Run Display Test
134 Run Pages Test
135 View Mech. Tests
136 View CPU Errors
137 View Kybd Errors
138 View Mech Errors
139 View Page Errors
140 View Wlbx Errors
141 Clear Errors
142 Run PowerUp Test
143 Run Inputs Test
144 Run Outputs Test
145 Run Index Test
146 Run Gripper Test
147 Run Short Test
148 Test All Disc
149 Run CD Tests

AUTO TEST
150 Run Auto Test
151 View Report
152 Print Report
153 Clear Report
154 Start MM/DD 00:00
155 Stop MM/DD 00:00
156 Elapsed 000:00
157 View Keybd Errors
158 View Mech Errors
159 View Page Errors
160 View Wlbx Errors

TCM SETUP
170 Recv Calls
171 Call Office
172 Call if Prob
173 Receive
174 Call for Service
175 Modem

AMP SETUP
180 AVC
181 Internal Amp
182 External Amp
183 Int Equalizer
184 Int Balance
185 Int MLWP
186 Int Loudness
187 Reset Int Amp
188 Ext Equalizer
189 Ext Balance
190 Ext MLWP
191 Ext Loudness
192 Reset Ext Amp

ERROR CODES

Diagnostic/Power-Up Error Codes: Readout with LED on the front of the control computer.

Error Value	Device Error	Error Code Explanation
0	NONE	All devices passed their specific test.
1	RAM	Unable to write/read each byte in RAM.
2	E2PROM	Unable to write/read each byte in E2prom.
3	EPROM	Eprom is corrupt.
4	RTCC	Unable to write/read a valid time in the real time counter clock.
5	KEYBOARD/DISPLAY	Unable to establish communication with the Keyboard/Display.
6	CD PLAYER	Unable to establish communication with the CD Player.

CPU (Input) Error Codes:

Error Value	Input Error	Error Code Explanation
C00	SERVICE	Service key depressed for longer than 1 minute.
C01	DIAGNOSTICS	Diagnostics key depressed for longer than 1 minute.
C02	RESUME	Resume key depressed for longer than 1 minute.
C05	COIN 1	Coin 1 input active for longer than 1 minute.
C06	COIN 2	Coin 2 input active for longer than 1 minute.
C07	COIN 3	Coin 3 input active for longer than 1 minute.
C08	COIN 4	Coin 4 Input active for longer than 1 minute.
C09	COIN 5	Coin 5 Input active for longer than 1 minute.
C10	COIN 6	Coin 6 Input active for longer than 1 minute.
C15	PAUSE	Pause key depressed for longer than 1 minute.
C16	CANCEL	Cancel key depressed for longer than 1 minute.

Keyboard Error Codes:

Error Value	Key Error	Error Code Explanation
K00	NUMBER 0	Number 0 key depressed for longer than 1 minute.
K01	NUMBER 1	Number 1 key depressed for longer than 1 minute.
K02	NUMBER 2	Number 2 key depressed for longer than 1 minute.
K03	NUMBER 3	Number 3 key depressed for longer than 1 minute.
K04	NUMBER 4	Number 4 key depressed for longer than 1 minute.
K05	NUMBER 5	Number 5 key depressed for longer than 1 minute.
K06	NUMBER 6	Number 6 key depressed for longer than 1 minute.
K07	NUMBER 7	Number 7 key depressed for longer than 1 minute.
K08	NUMBER 8	Number 8 key depressed for longer than 1 minute.
K09	NUMBER 9	Number 9 key depressed for longer than 1 minute.
K10	PAGE LEFT	Page Left key depressed for longer than 1 minute.
K11	PAGE RIGHT	Page Right key depressed for longer than 1 minute.
K12	PLAY HITS	Play Hits key depressed for longer than 1 minute.
K13	RESET	Reset key depressed for longer than 1 minute.

Mechanism Error Codes:

Error Value	Mechanism Error	Error Code Explanation
M01	MAGAZINE	Unable to locate a compact disc (slot number).
M02	LOADING	Unable to load a compact disc.
M03	UNLOADING	Unable to unload a compact disc.
M04	COMMUNICATION	Unable to establish communication with CD player.
M05	CD RESPONSE	Unable to obtain the correct response from the CD player.

Page Unit Error Codes:

Error Value	Page Unit Error	Error Code Explanation
P01	PAGE LEFT	Unable to flip the pages left.
P02	PAGE RIGHT	Unable to flip the pages right.

Wurlitzer Jukebox
Basic Programming and Troubleshooting

Getting Started

Upon opening the door of the Wurlitzer, check to see if there is a "Continuous Play" toggle switch in the lower right corner of the jukebox. If the switch is there, make sure it is set to OFF.

Many times coins are jammed in the long narrow coin chute. Check that the Jukebox accepts coins. Several of the Bill Acceptors only take bills face down. Make a note if this is the case. The lock for the Bill Acceptor is on the bottom of the stacker. You will need a "301" or a "302" key to open the stacker. Once the stacker box is removed, pull down slightly on the chrome tube at the top of the bill acceptor and lift up on the stacker. This will allow you to remove any debris from the bill acceptor.

Remove the Volume Control Box from the back of the jukebox. Leave it on the inside floor of the jukebox.

Programming

To enter the Service Mode, set the Service switch (located on the Credit Computer) to "ON", then press the "LT" button. To exit the Service Mode set the Service switch to "OFF" and then press the "LT" button. Press the "R" button to cancel any procedure or to return to the beginning of the menu. Always press "R" before going to the next procedure. From the SERVICE MODE:

1. **Meter:** Press #2 to display the current meter reading. The Wurlitzer meter advances one number for every 25 cents.

2. **Clock:** To set the clock, press and HOLD #4 and press button "R". Release. Then press "0" to display the present time. To reprogram, press and HOLD"0" and press "R". The display will go dark. Enter the correct time and then press "0" again to secure your selection.

3. **Autoplay:** Press #5 to determine the number of CD's programmed and the interval time between Autoplay tracks. The 4 digit display will read the number of CD's followed by the interval time. It should read "5010". This means there are 50 CD's in the carrier and the Autoplay will play a random track every 10 minutes. To reprogram, press and HOLD #5 and press button "R". Release. The display will go dark.. Then enter "5010". Press #5 again to secure your selection. Next you will need to program the Start and Stop time for Autoplay. Press "R" to return to the beginning menu. Press and HOLD button #4 and press button "R". Release. The display will go dark. Then press button #8. The display will flash the number 1 followed by the Start Time. Press button #8 again and the display will flash the number 2, followed by the Stop Time. To reprogram, press and HOLD button #8 and press "R". The display will go dark. Enter the Start and Stop Time with 8 digits. Press #8 again to secure your selection. REMEMBER, Autoplay will not work if there are credits on the Jukebox.

4. **Carrier Test:** Press #8 to rotate the Carrier

5. **Gripper Arm Test:** Press #7 to test the Gripper Arm. Be sure that the CD is not being slammed onto the Centering Hub. It should float about $1/16^{th}$ of an inch above the CD Player Turntable.

6. **CD Player Test:** Press #9 to play the CD that you have placed on the CD Player Turntable.

7. **Disable Tracks:** Press and HOLD #4 and press button "R". Release. The display will go dark. Press button #4. This will display a "Locked Out" track number. Continue to press #4 to scroll through the locked out tracks. To reprogram, Press and HOLD #4 and press button "R". Release. The display will go dark. Enter the track you wish disabled and then press #4 to secure your selection.

Troubleshooting

For repair and test purposes, it is possible to give test credits. Simple push the CREDIT button located next to the coin chute. Test credits will NOT be recorded on the electronic meter.
To clear all credits on the Jukebox at any time, simply press the "LT" button once.

Before every play the Wurlitzer Jukebox "reads" the contents of the CD. If it is unable to read the contents due to an alignment problem, it will not play the track.
Check these components if the Jukebox will not play the selected track:

1. Check that the Gripper Arm sets the CD about $1/16^{th}$ of an inch over the Centering Hub. The CD will then drop onto the Centering Hub when released by the Gripper Arm. If the CD is being slammed onto the Centering Hub, it will damage the hub and the CD will not rotate properly. Bend up on the metal arm of the CD chassis to insure proper clearance.
2. Check the Centering Hub for damage. If more than 3 of the "fingers" on the plastic Centering Hub are broken, the CD will not rotate properly. Replace the Centering Hub by prying off the old one and snapping on a new one.
3. Check that the CD is centered properly over the Centering Hub. You can do this by pressing #7 while in Service Mode. If the CD is not sitting centered over the Hub, there are 2 "screw" adjustments that can be made to align the CD Chassis with the CD. On the far right side of the CD Chassis is the first adjustment screw. (you can rotate it by using the adjustment tool located to the right of the CD carrier. It is a gold "wrench". Just pull it off of it's harness clip). The second adjustment screw is located at the rear of the CD Chassis. You will need to loosen the top 2 screws to be able to make this adjustment.
4. Play a song while in Service Mode to verify that the CD Turntable is working properly. If you can play a song in Service Mode, but not in regular mode, then you have a bad Selection & Credit Computer. To do this, first get into Service Mode, then press #7 to place the CD on the player, then press #6 to play a song.

Muzak Hookup

If Muzak is already wired into the jukebox, you may disregard this section.

You will need to provide a Fixed Line Level Output for Muzak to tap into. You will need 2 RCA Splitter Cables (Radio Shack part #42-2436) and 2 RCA Extension Cables (Radio Shack part #42-2309).

Plug the male ends of the two splitter cables directly into the back of the CD Turntable. You will need to unplug the two Wurlitzer RCA cables first. Plug one of the Wurlitzer RCA cables into the one of the female ends of the Splitter Cable. Do the same with the other Wurlitzer RCA cable. Plug one of the Extension Cables into the other female end of the Splitter Cable. Do the same with the other Extension Cable. Leave the two Extension Cables hanging out of the back of the jukebox. These are your Line Level Outputs.

Video Games 11

VIDEOGAME TROUBLESHOOTING

These troubleshooting procedures work for all games and all manufacturers. Performed properly, they will lead you to the cause of a failure in a minimum amount of time.

One thing that will help minimize the amount of time troubleshooting is to make certain that you do not waste time testing things that cannot possibly be the cause of the problem. Very often, a few minutes of thought or a simple test or two can completely eliminate some parts of the game as possible causes of a failure.

Inspection

One simple procedure that you should always use when working on a videogame is "visual inspection." Whenever you work on a game, always spend a few minutes simply looking at things. Look for the obvious, like burned parts and intermittent or pulled-apart connectors. Bad solder joints are especially common where a connector jack is soldered to a printed circuit board, carefully 'wiggle' the cable side connectors and watch for something to change with the game.

Blank screen

The most common symptom of a videogame failure is a blank screen. There are a few things that can cause this. The monitor might be bad, the computer might be down, or perhaps the power supply that powers the computer has failed. It would be a waste of time to troubleshoot the monitor if the problem was somewhere else.

When you begin working on a videogame with a blank screen, the first thing you should do (after verifying that it's plugged in and turned on, of course) is to try "coining" the game. Drop a coin through the coin mech, then press the start button and listen for sounds of the game.

If you don't hear any of the sounds, you should not begin working on the monitor. If you cannot hear any of the sounds or see a picture, your problem is not in the monitor. The problem must be in the computer or the power supply. The screen is blank because the computer system isn't sending out the signals that are required to create a display (video, sync, etc.)

Once you have narrowed the problem down to the computer or the power supply, you begin a step-by-step testing procedure that lets you pinpoint the cause of the failure. The first step is to turn the power off and check all of the fuses in the cabinet of the game.

Always use a meter to test fuses! Never depend on looking at a fuse to see if it is good. A fuse might look good but will be bad. Of course, if a fuse is broken inside you can call it bad but visual inspection should not be used to verify that a fuse is good.

There are only a few things that might blow the main AC power fuse in a videogame. Since the power supply and monitor are usually fused separately, the likely things that can blow the main AC power fuse are the fluorescent light on the marquis, the fan (if equipped) and the isolation transformer that powers the monitor. The chance of any of these failing is very small. The main AC power fuse in a videogame rarely fails.

If the fuses test okay, the next step is to check the power supply. Test all of the outputs of the power supply (+5 volts, +12 volts and -12 volts.) It is best to test the supplies at the computer board, not at the power supply. This way, you are testing the power supply, the wiring and the connectors between the two at the same time. Test the voltages by touching the leads of your digital multimeter to the contacts on the edge of the computer board (logic board.) Consult the wiring diagram or schematic for the location of the power connections.

If all of the power supply voltages test good but the game doesn't work, the problem is probably a failure in the logic board.

Thermally Intermittent Failures

Many games fail when they get hot. The game will work fine when it is first turned on in the morning, but after warming up, the a board fails. Sometimes a defective integrated circuit will get hot. Try feeling all of the ICs. Just lay your hands on the top of the board and feel the integrated circuits. Integrated circuits will be warm but an integrated circuit that is too hot to touch is definitely bad! Try feeling the ICs on a good, working system to get an idea of normal operating temperatures. This type of failure is "thermally intermittent".

"Garbage" on the screen

A bad logic board may fail causing the monitor screen that is filled with bits of letters, numbers and other graphics.

Many videogames have a "self-test" feature. The self-test will test the ROMs, RAMs and CD or Hard Drives in the computer and isolate the defect. Unfortunately, the computer must be working to a certain degree to run this test, so it's not always effective. If the self-test does work, it can locate these defective components.

WARNING

This machine is subject to breakdowns during periods of critical need.

A special circuit in the machine called a ***Critical Detector*** senses the operator's emotional state in terms of how desperate he or she is to use the machine. The Critical Detector then creates a malfunction proportional to the desperation of the operator. Threatening the machine with violence only aggravates the situation. Likewise, attempts to use another machine may cause it to also malfunction. These machines all belong to the same union. Keep cool and say nice things to the machine, nothing else seems to work.