

ICE-BALL™



OWNERS AND SERVICE MANUAL
INNOVATIVE CONCEPTS IN ENTERTAINMENT INC.

TABLE OF CONTENTS

INTRODUCTION.....	PAGE 3
· GAME FEATURES	
· GAME PLAY	
ASSEMBLY.....	PAGE 4
· BEFORE YOU BEGIN	
· TOOLS NEEDED	
· INSTALLATION	
SET-UP / TESTING.....	PAGE 5 - 8
· SAFETY PRECAUTIONS	
· PROGRAMMING YOUR GAME	
· OPTION MODES	
· ERROR CODES	
· TESTING	
QUICK TROUBLESHOOTING.....	PAGE 9 - 10
· PROBLEMS AND SOLUTIONS	
REPAIR.....	PAGE 11 - 13
· OPERATIONAL BACKGROUND	
· MECHANICAL REPAIR	
· ELECTRICAL / ELECTRONIC REPAIR	
· MAINTENANCE	
PARTS LISTINGS.....	PAGE 14
SCHEMATICS.....	PAGE 15

INTRODUCTION

GAME FEATURES

Thank you for your purchase of the new **ICE BALL™** Alley Roller game from I.C.E. Through extensive testing and consultation with game operators, we have developed a game with all of the features and serviceability you've been asking for. We have gone to great lengths to manufacture an Alley Roller game that is far easier to service and operate than anything before it. The features we have added, truly bring this game up to date.

The game starts off with unparalleled ease of assembly. The game goes together in just a few minutes.

The game cabinetry is a unique plywood construction with a special overlay for a superior finish. A special lacquer finish is applied over the wood for a beautiful rich, deep look. All of the cabinet panels interlock together, are reinforced with cleats and are glued together to produce a cabinet that can handle all of the abuse you can give it.

Loading tickets is a snap, with our easy pull out drawer. This new feature drastically reduces the time needed to load tickets, as well as making it much to service ticket jams or the dispenser.

Long life fluorescent lighting is used throughout the game to lower maintenance and create a bright playfield area. Even the ball return area is back lit to add to the appearance and serviceability of the game.

Reliability is the name of the game with our new ball release assembly. With a specially engineered solenoid and double linkages, this mechanism has been tested to last for years. Best of all, the entire assembly simply lifts out of the cabinet with no tools needed!

The best state of the art sound on sound audio is used to create an exciting atmosphere for the game player. Even our background theme is synchronized so all games play the theme at the same time, even when only one game is being played.

ICE BALL™ allows the operator to give the players extra balls when a certain point threshold is reached. In addition, double scores can be awarded if desired. This extends the total points possible and adds a great deal to player appeal. These features also add excitement when used in conjunction with the optional Jackpot Marquee.

Another important feature of our game is the operator selectable "Balls per game". This feature allows the operator to control how many balls the game will normally deliver. This amount is adjustable from 1 to 20 balls per game. It is however important to note that **THE BALLS PER GAME IS NOT RELATED TO HOW MANY BALLS ARE IN THE GAME**. The quantity of balls in the game is only for reference based on the normal 9 balls given in the traditional game. The game will work with 1 to 15 balls in the game, yet deliver the proper amount programmed into the game every time. (It is a good idea however to have at least 3 balls in the game to avoid slow play)

All programming is accomplished from the Main P.C. Board which is conveniently located at the front end of the cabinet. This make servicing and adjusting as easy as turning a key.

GAME PLAY

Game play begins when a player has inserted enough money into the game to create 1 "Credit". At this point, the "Start" button begins to flash.

When the start button is pressed, the balls release from the game and the game begins.

The player throws balls at the target pockets and is awarded the points indicated on those pockets.

The player continues to throw balls until they are all used up. If the player breaks a predetermined score during game play, he may be entitled to get "Free Balls".

At the end of the game, the game will dispense tickets based on score. (If the game is so equipped)

If the player gets a "New High Score" or "Extended Play" the rotating Beacon light will turn on. The Beacon light will also turn on if the player has won the ticket jackpot from the Optional Jackpot Marquee.

ASSEMBLY

BEFORE YOU BEGIN

WARNING: WHEN INSTALLING THIS GAME, A 3 PRONG GROUNDED A.C. 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, 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.

HAVE A QUALIFIED ELECTRICIAN CHECK YOUR A.C. RECEPTACLE TO BE SURE THE GROUND IS FUNCTIONING PROPERLY.

TOOLS NEEDED

- Large Allen Key (Supplied)
- Phillips head screwdriver

INSTALLATION

1. Remove the banding from the pallet.

NOTE: BE SURE TO STAND TO THE SIDE WHEN CUTTING THE BANDS, AS THEY ARE UNDER PRESSURE, AND COULD SPRING OUT CAUSING INJURY.

2. Lift out all cage parts as well as any other parts shipped along with the game.
3. Remove the 2 game halves from the pallet.
4. Set the rear of the game into the approximate location of where it will be located. If assembling more than 1 game, you must leave space to run the power cords and linking phone cord.
5. Set the front cabinet into position in front of the rear cabinet.
6. Open the coin and ticket doors and slide the left side cover forward enough to connect the harnessing from the rear cabinet to the front cabinet.
7. Slide the left hand cover back on.

8. Slide the front cabinet into position. Insert the large Allen key into the holes on the sides of the front cabinet and rotate the Allen key 180° to lock the cabinet halves together.
9. Slide the right hand cover from the game.
10. Remove the packing material from around the ball release assembly.

NOTE: KEEP THE PACKING MATERIAL FOR THE BALL RELEASE ASSEMBLY BEHIND THE GAME IN CASE YOU DECIDE TO MOVE YOUR GAME LATER.

11. Open the parts box containing the balls and install them into the ball return release. (There should be 9 balls supplied with the game)
12. Slide the right hand cover back onto the game.
13. Open the electronics access door. (Door in between the ticket and coin drawers)
14. On each Main P.C. Board are 2 modular phone jacks. Connect a phone line from game to game, plugging 1 end into each game. Feed the phone lines through a wiring hole located in the rear of the electronic enclosure. It does not matter which jack you plug the phone line into on the board as long as the phone lines are connected from game to game. If you are installing a Jackpot Marquee, it can be connected to any open phone jack on any game.
15. Connect the long Computer style power cord to the Power Module. The power module is located inside the Electronics access door, to the lower right. Connect the other end to a grounded A.C. outlet.*

* Be sure before plugging the game in that it is wired for the proper A.C. voltage. One way to check is by looking at the game's serial number tag. It will indicate the rated voltage on it. If you are still unsure about what the game's voltage is set for, please refer to the "Setting A.C. line voltages" section in this manual.

SET-UP / GAME TESTING

SAFETY PRECAUTIONS

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

WARNING: WHEN INSTALLING THIS GAME, A 3 PRONG GROUNDED A.C. 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, 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.

HAVE A QUALIFIED ELECTRICIAN CHECK YOU'RE A.C. RECEPTACLE TO BE SURE THE GROUND IS FUNCTIONING PROPERLY.

REPLACE ALL INCANDESCENT BULBS WITH PROPER ICE SUPPLIED BULBS ONLY

PROGRAMMING YOUR GAME

This section will give you a detailed explanation of the functions and operating characteristics of each of the programming buttons.

PLEASE READ THIS SECTION CAREFULLY TO AVOID PROBLEMS WITH YOUR GAME.

NOTE: THE PROGRAMMING AND TEST BUTTONS ARE LOCATED ALONG THE FRONT EDGE OF THE MAIN P.C. BOARD WHICH IS LOCATED BEHIND THE ELECTRONICS ACCESS DOOR. THIS DOOR IS BETWEEN THE TICKET AND COIN DRAWERS AT THE FRONT OF THE GAME.

PROGRAMMING BUTTON (PGM / SW1)

This button is used to enter and exit the programming mode. Use this button to change game settings or to remotely change settings on the optional Jackpot Marquee. Press this button once to enter programming mode. When in this mode, the game displays will display information pertinent to game programming. Press this button once again to exit programming mode.

Once in this mode, you can push SW2, SW3 or SW4 to make adjustments to the game.

SELECT BUTTON (SEL / SW2)

This button is used to advance through all of the various programming option modes. Each push of this button will move you to the next programmable option. The option number is displayed in the "Balls Left" display.

STEP UP BUTTON (UP / SW3)

This button is used to change the VALUE of a particular option mode. The operation mode values are displayed on the "Score" display. Each push of this button changes to the next HIGHER available value for that mode.

SET-UP / GAME TESTING

TEST BUTTON (TEST / SW5)

This button is used for factory burn-in of the game electronics. It is also very helpful to be sure all game functions work correctly. When in this mode, the following things will happen:

- Game release solenoid will cycle on and off
- Displays will count down displaying similar numbers. (Ex.: all 9's or 8's)
- Beacon light will cycle on and off.
- Closing any score (playfield) switch by throwing a ball will create an audible sound.
- Pushing the start button, coin switch or low ticket micro switch will create an audible sound.
- Game theme song will constantly play.

To exit the test mode, press the programming button.

OPTIONS MODES

Please read the setting information carefully BEFORE making any adjustments. Failure to set options properly can yield unexpected results.

PLEASE NOTE: THE VALUES PRE-SET AT THE FACTORY HAVE BEEN FOUND TO WORK BEST FOR MOST LOCATIONS.

MODE 00 (VOLUME)

This option is used to change the relative sound volume of the game. "1" is the lowest the game can be set to play at while "4" is the loudest. Each time the button is pushed, a sound is played to make it easier to determine where the volume level should be set. The factory default for this option mode is "3".

MODE 01 (COINS PER CREDIT) COIN INPUT #1

This mode determines how many coins are needed to create 1 credit for coin input #1. (This is also the only coin input normally adjusted for most usage) This value can be adjusted from 0-8. Setting a "1" would indicate 1 coin is needed to obtain 1 credit. A "2" would indicate 2 coins are needed to obtain 1 credit. Setting a "0" sets the game to the "FREE PLAY" mode. The factory default for this setting is "1".

MODE 02 (COINS PER CREDIT) COIN INPUTS #2

This coin input functions in an identical fashion to that of MODE 01. This option is generally used in markets that require the use of electronic multi-mechs. Consult our service department if you have any questions regarding the use of electronic multi-mechs.

MODE 03 (GAMES PER CREDIT)

This mode can be used to create multiple credits for each coin inserted. For example: setting a "2" would give you 2 credits for each coin inserted. The range for this option is 0-9. Setting a "0" turns this option off. The default for this option is "0".

SET-UP / GAME TESTING

MODE 04 (COIN DISCOUNTING)

This option is used to create "Bonus Credits". The way this option works is as follows: if a "3" is set, for every 3 coins put in AT THE SAME TIME, 1 extra credit would be given. The range for this option is 0-9. Setting a "0" turns this option off. The default value for this option is "0".

MODE 05 (BALLS PER GAME)

This option determines the STANDARD amount of balls dispensed per game. This amount DOES NOT include any other balls that may be dispensed by other option settings.

NOTE: THE NUMBER SET WILL DETERMINE HOW MANY BALLS ARE DISPENSED PER GAME. THE NUMBER IS NOT DETERMINED BY THE BALLS KEPT IN THE GAME. THE NUMBER OF BALLS IN THE GAME IS BASICALLY USED AS A BALL SUPPLY. THIS AMOUNT SHOULD NOT BE ALLOWED TO GO BELOW THREE (3) OR ABOVE FIFTEEN (15).

The range for this option is 0-20. The default value for this option is "9". (The traditional balls per game value for alley roller games).

POINT SETTING INFORMATION

IN SOME OF THE MODES BELOW, POINT VALUE WILL BE DISCUSSED.

THIS GAME HAS THE ABILITY TO BE SET FOR 3 DIFFERENT POINT LEVELS. WHENEVER POINT VALUES ARE DISCUSSED, THE SIGNIFICANT (FRONT END NUMBERS) ARE DISCUSSED. THE TRAILING "00'S" ARE NOT IMPORTANT.

EXAMPLE: SETTING A "30" WOULD BE GOOD FOR 300 OR 3,000 POINTS. SETTING A 300 WOULD BE GOOD FOR 3,000 OR 30,000 POINTS.

FOR FURTHER INFORMATION CALL:

I.C.E. SERVICE DEPARTMENT
716-759-0360

NORMAL BUSINESS HOURS ARE:
MONDAY – FRIDAY, 9:00 AM TO 6:00 PM EST

MODE 06 (ATTRACT TIME)

This mode will play the game's "Attract" mode when selected. The attract mode consists of the game's theme song being played, along with the beacon light turning on. The values for this mode (in minutes) is 0-30. Setting a "0" turns the attract mode off. The default value for this mode is "3".

MODE 07 (POINT PER TICKET)

This option adjusts the points needed to dispense a ticket. Setting a value of 30 will dispense 1 ticket for every 3,000 points scored. The range for this option is 0-9999. The default value for this mode is "30". (ticket for every 3,000 points)

MODE 08 (MINIMUM TICKETS)

This mode sets the minimum amount of tickets that can be dispensed in a game. This would be the equivalent of a "just for playing" option. This amount set IS NOT in addition to other tickets won. If the amount of tickets normally won exceeds the minimum amount set, that number is the number awarded. The range for this option is 0-10. Setting a "0" turns this option off. The default value for this mode is "4".

MODE 09 (TICKET CAP)

This mode determines the maximum amount of tickets that can be given in a game REGARDLESS of points made.

NOTE: THIS MAXIMUM WILL NOT AFFECT THE TICKETS DISPENSED FOR WINNING THE TICKET JACKPOT FROM THE OPTIONAL "JACKPOT MARQUEE". ANY JACKPOT TICKET CAP WILL BE HANDLED BY THE JACKPOT MARQUEE.

The range for this option is 0-50. Setting a "0" turns the option off. The default setting is "0".

SET-UP / GAME TESTING

MODE 10 (THEME PLAY ON)

This mode allows the game's theme song to be eliminated during game play. Setting a "1" plays the theme during game play. Setting a "0" turns the theme song off. It is advisable to leave the song play during the game, as it adds excitement to the game and speeds up game play.

NOTE: THE GAME'S THEME SONG IS SYNCHRONIZED ON ALL GAMES. WHEN 1 GAME IS STARTED, THE THEME PLAYS ON ALL GAMES. THIS PREVENTS SONGS PLAYING AT DIFFERENT TIMES AND THE DISTRACTING NOISES ASSOCIATED WITH THAT CONDITION. THIS SYNCHRONIZATION DOES NOT AFFECT GAME PLAY IN ANY WAY AND IS A BENEFICIAL DESIGN CONSIDERATION.

MODE 11 (FACTORY DEFAULTS)

When this mode is selected, the game will revert to all factory default settings.

SET "1", THEN EXIT PROGRAMMING MODE TO RESET ALL VALUES TO FACTORY DEFAULT.

The default for this mode is "0".

ERROR CODES

When the game is powered up it will report an error based on what sensor is bad. It will not continue until the error has been corrected. This will only occur during power up. If a sensor becomes blocked after power up, the game will not detect this as an error.

Error 1	0K Ball Return
Error 2	1K Score Problem
Error 3	2K Score Problem
Error 4	3K Score Problem
Error 5	4K Score Problem
Error 6	10K Right Sensor Problem
Error 7	10K Left Sensor Problem
Error 8	Ball Count Problem
Error 9	Ticket Disconnect
Error 10	Coin Disconnect
Error 11	Coin Switch Stuck
Error 16	Ball Trough not plugged in

TESTING

After the game is installed and set up, it is a good idea to play a few games, to be sure everything is working properly.

Play a few games paying special attention to the following areas:

- Balls per game
- Tickets dispensed
- Beacon light working
- Proper scoring
- Proper jackpot (If using Marquee)

IF YOU HAVE ANY QUESTIONS OR COMMENTS REGARDING INSTALLATION OR PROPER FUNCTION OF YOUR GAME, PLEASE CALL OUR SERVICE DEPARTMENT AT:

I.C.E. SERVICE DEPARTMENT
716-759-0360

NORMAL BUSINESS HOURS ARE:
MONDAY – FRIDAY, 9:00 AM TO 6:00 PM EST

QUICK TROUBLESHOOTING

GAME WILL NOT TAKE OR ADD MONEY CORRECTLY

- Micro switch not working or returning properly. Check and repair or replace as necessary.
- Game programming set-up incorrectly. Refer to service manual for proper settings.
- Bad harnessing or connector. Check w/ohm meter and repair if necessary.
- Bad Main P.C. Board. Check and repair or replace as necessary.

START BUTTON WILL NOT FLASH WHEN GAME HAS CREDITS, OR WORK WHEN PUSHED

- Micro switch not working properly. Test and replace as necessary.
- Micro switch popped out of housing. Snap back into housing.
- Burned out light bulb. Replace light bulb.
- Bad harnessing or connector. Check w/ohm meter and repair as necessary.
- Bad Main P.C. Board. Check and repair or replace as necessary.

GAME HAS NO SOUND

- Bad speaker. Check w/ohm meter for 8-ohm load and replace if defective.
- Volume level set incorrectly. Check service manual for volume setting procedures.
- Bad Harnessing or connector. Check w/ohm meter and repair if necessary.
- Bad Main P.C. Board. Check and repair or replace as necessary.
- Main P.C. Board fan bad & I.C.'s overheated. Replace fan.

BALLS WILL NOT RELEASE OR WILL NOT STOP RELEASING

- Solenoid burned out. Replace solenoid.
- Solenoid sticks in. replace solenoid.
- Release lever binding. Check, lubricate or replace as necessary.
- Release return spring broken. Replace spring.
- Bad ball count sensor. Check and replace as necessary.
- Bad connector or harnessing. Check w/ohm meter and repair as necessary.
- Bad Opto-isolator. Check w/ohm meter and replace if necessary.
- Bad Main P.C. Board. Check and repair or replace as necessary.
- Debris jamming ball return system. Clean return area.

GAME WILL NOT ADD POINTS CORRECTLY / COUNTS BALLS WHEN NOT THROWN

- Bad score sensor. Check and repair or replace.
- Score sensor wiring bad. Check w/ohm meter and repair or replace.
- Cabinet harnessing bad. Check w/ohm meter and repair or replace as necessary.
- Sensors loose or misaligned. Realign sensors.
- Main P.C. Board bad. Check and repair or replace as necessary.

TICKET DISPENSER DOES NOT WORK OR WORKS IMPROPERLY

- Bad harnessing. Check w/ohm meter and repair if necessary.
- Bad ticket dispenser. Repair or replace ticket dispenser.
- Dispenser out of tickets. Add tickets.
- Bad Main P.C. Board. Check and repair or replace as necessary.
- Optical sensor on dispenser dirty. Clean sensor.

SCORE DISPLAY WILL NOT LIGHT OR WORKS IMPROPERLY

- No power on Main P.C. Board. Check transformer and fuses / check power module
- Bad connectors or harnessing. Check w/ohm meter and repair as necessary.
- Bad Display P.C. Board. Repair or replace as necessary.
- Bad Main P.C. Board. Repair or replace as necessary.

QUICK TROUBLESHOOTING

NO FLUORESCENT LIGHTING

- Bad connectors or harnessing. Check w/ohm meter and repair as necessary.
- Bad ballast transformer. Replace ballast transformer.
- Bad bulb. Replace bulb.
- No A.C. power to game. Check main fuses in power module.

GAME WILL NOT RETAIN HIGH SCORE WHEN GAME TURNED OFF AND THEN BACK ON

- Programming set incorrectly.
- Back up battery on Main P.C. Board bad. Check and replace battery if necessary.

GAMES ACT STRANGELY FOR NO APPARENT REASON

- Game I.D.'s set improperly. Refer to service manual for proper settings.
- Game hit by electrostatic discharge. Turn games off, wait 15 seconds and turn back on.
- Bad Main P.C. Board. Check and repair or replace as necessary.

REFER TO THE NEXT SECTION FOR DETAILED INFORMATION
ON REPLACEMENT OF P.C. BOARDS AND MECHANICAL COMPONENTS

GAME REPAIR

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

OPERATIONAL BACKGROUND

The **ICE BALL™** game has been designed with MODULAR repair in mind. The coin drawer and ticket drawer can be slid out and removed in their entirety to be worked on in another area if desired. The ball release assembly can be removed as a unit with no tools necessary, making repair a snap.

The ball release system utilizes an A.C. Pull tpe solenoid that has been specifically designed to eliminate residual magnetism problems commonly found in this type of solenoid. The solenoid is powered via an Opto-isolator, to eliminate solenoid noise from the electronic circuitry.

Other than the display, all electronics and power supply components are located on the Main P.C. Board to make modular type replacement fast and simple.

The display board has been designed to be very reliable and easy to repair. Very few drive components are necessary for this type of display.

TROUBLESHOOTING PHILOSOPHY

To find problems with the game, always first check what should be obvious. See that the game is plugged in and that all of the fuses on the game are good. This includes the fuse that is located **INSIDE** the power module.

Next, check to see that all of the connectors are firmly seated and that none of the wires have pulled out of them.

When trying to find out if specific components are bad or not, try swapping them with components from another player station to see if the problem moves with the component, or stays where it was. This will help you to know 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 if the game is powered up. If doing continuity checks, it is important to disconnect the harnessing at both, as attached they may yield erroneous results.

If P.C. Boards are suspected as causing problems, check to see that all of the I.C. chips are firmly seated on the boards.

If light bulbs are suspected, swap them with one that is known to work to narrow the problem down to the bulb or P.C. Board.

MECHANICAL REPAIR

BALL RELEASE ASSEMBLY

WARNING: BE SURE POWER HAS BEEN REMOVED FROM THE GAME BEFORE PROCEEDING.

1. Open the cash box drawer at least 6 inches.
2. Pull forward on the ball release cover. (The panel with the clear plastic window) about 3 inches to disengage, then lift off.
3. Remove the balls from the game.
4. Grasp the release assembly by the rail and slowly lift out, being careful to avoid hitting the sensors on the cover retaining screws.
5. Disconnect the connector that connects the release assembly to the game.

SOLENOID REPLACEMENT

1. Remove the spring from the solenoid and mounting bolt.
2. Remove the cotter pin from the clevis pin and slide the clevis pin from the solenoid shaft and linkage.

GAME REPAIR

3. Carefully scribe a mark when removing the solenoid to be sure the replacement is properly located.
4. Remove the hardware that secures the solenoid to the mounting plate.
5. When re-assembling, be sure to use the same size cotter pin to retain the clevis pin, as this pin is needed to hold the spring to the solenoid assembly.
6. Be sure the bent over end of the cotter pin is trimmed so it cannot contact the solenoid body.

SOLENOID REPLACEMENT

1. The ball count sensor must be replaced as an assembly. Remove the transmitter, receiver and sensor P.C. Board from the release assembly.
2. When replacing the unit, it is important to remember to use the star washers. This will prevent the sensors from rotating or loosening.
3. Be sure to install the new sensors in the same position as the old ones. This is important to insure proper alignment and consequently proper ball count

BULB REPLACEMENT

1. The bulbs replace easily. Pull the bulb straight out of the socket.
2. Insert the new bulb into the socket and snap into place.

ELECTRONIC REPAIR

DISPLAY ASSEMBLY

SCORE DISPLAY ASSEMBLY

1. Unlock and remove the display cover.
2. Lift the entire assembly straight up, then pull the bottom forward and remove connectors from the rear.
3. Unscrew the display from the mounting bracket.
4. Assemble in reverse order.

BULB REPLACEMENT

1. Unlock and remove the display cover.
2. Pull the old bulb straight out of the socket.
3. Push a new bulb straight into the socket and snap into place.

MAIN P.C. BOARD

1. Turn off A.C. power and remove the power cord from the power module.
2. Remove all P.C. Board connectors noting where each one connects into the board.
3. Remove the 4 hex fasteners that retain the board to the mounting bracket.
4. Re-assemble in reverse order.

GAME REPAIR

BALL RETURN SENSOR

1. Turn off game power.
2. Open cash drawer at least 6 inches.
3. Slide ball release cover from right hand side of game.
4. Sensor assembly is located at the rear of the ball return channel where the 2 cabinets meet.
5. Unscrew the sensor assembly and remove.
6. Assemble in reverse order.

NOTE: BE SURE THE TRANSMITTER WIRING IS KEPT HIGH ENOUGH FOR THE BALLS TO PASS UNDER. IF THERE IS ANY SLACK, IT IS IMPORTANT TO REMOVE IT USING A TIE WRAP, ETC.

SCORE SENSORS

1. Remove all A.C. power from the game.
2. Remove the 6 screws from the front of the cage and remove the front of the cage.
3. Remove the single screw from the bottom of each cage side and remove the sides.
4. Remove the 2 retaining screws on the playfield.
5. Remove the playfield.
6. Re-connect power to the game and put the game in test mode.
7. Run your hand through each sensor pair and listen for the sound to indicate proper function.
8. If the sensor does not indicate proper function, remove the sensor and replace.
9. Re-assemble in reverse order.
10. Re-test the assembly when finished.

MAINTENANCE

Maintenance is easy as the game requires very little service under normal use. To get the best out of the game, please perform the following as indicated:

- Clean the playfield weekly using Wildcat pinball cleaner.
- Clean the playfield once every 3 months with a buffing wheel and Novus polish.
- Oil the levers and linkages on the release system every 6 months.
- Polish the cabinet with a good grade of spray furniture polish every 6 months.

PARTS LISTINGS

MECHANICAL PARTS

AR1001	Ball Rail
AR1002	Ball Return Tray
AR1003	Rail Support Spacer
AR1004	Ball Release Lever Spring
AR1005	Cash Box
AR1007	Solenoid Linkage
AR1009	Ball Release Lever Bracket
AR1011	Channel Cover, LEFT
AR1012	Channel Cover, RIGHT
AR1016	Alley Edge Protector, REAR
AR1018	Ball Release Lever
AR1019	Alley Edge Protector, FRONT
AR1020	Cup Connecting Plates
1024	Ticket Bin
1026	Ticket Bin Switch Mounting Bracket
AR1029	Speaker Grille
AR1033	Cage, LEFT SIDE
AR1034	Cage, RIGHT SIDE
AR1035	Cage, FRONT
AR2017	Diffuser Support
AR3000	Runaway Material w/Adhesive
AR3001	Ball Jump
AR3005	Ball Cover Window
AR3006	Playfield Light Cover
AR3008	PL7 Light Diffuser
AR3010	Cup, 10,000 Point
AR3011	Cup, 5,000 Point
AR3012	Cup, 4,000 Point
AR3013	Cup, 2,000 and 3,000 Point
AR3014	Cup, 1,000 Point
AR3015	Cup, Bottom Ring
AR3017	Insulating Grommet
AR3020	Runaway Ball Bumper Material
AR3021	Ball Stop Grommet
AR3024	Ball
AR3065	Runaway Ball Bumper Cap, Left Side
AR3066	Runaway Ball Bumper Cap, Right Side
AR3069	Ball Diverter
5014	Coin Door Lock
5101	Mech Holder
6105	Latch Tool
6111	Fiber Lever Washer
6117	Clevis Pin 3/4"
6118	Clevis Pin 1"

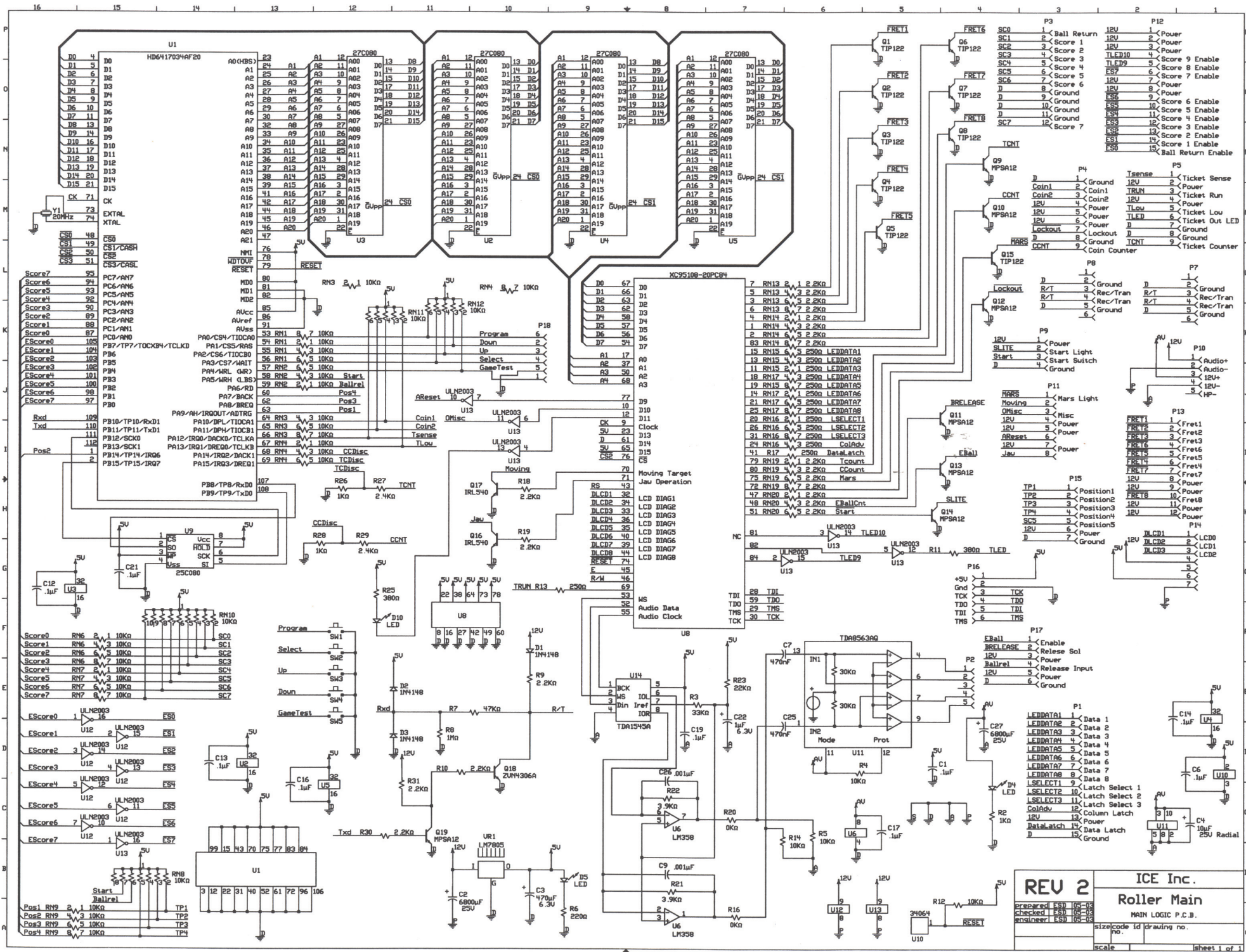
GRAPHICS & DECALS

AR7201	Display Panel
AR7221	Programming Decal (Part 1)
AR7222	Programming Decal (Part 2)
AR7003	Coin Door Decal
AR7004	Ticket Door Decal
AR7008	Instruction Panel
RB7009	Fuse Rating Decal
AR7014	10,000 Point Decal, Left Hand Side
AR7015	5,000 Point Decal
AR7016	4,000 Point Decal
AR7017	3,000 Point Decal
AR7018	2,000 Point Decal
AR7019	1,000 Point Decal
AR7020	10,000 Point Decal, Right Hand Side
AR9001	Service Manual

ELECTRICAL / ELECTRONIC PARTS

211	Low Ticket Switch
248	PL7 Transformer
249	PL7 Bulb
251	PL7 Socket
DA2033X	PCBA - (Small Display)
RB2032X	PCBA - (Large Display)
DA2002X	Transformer
AR2005	Start Button
HP2006B	Blue Rotating Beacon Light
AR2007	Speaker 6 X 9
AR2008	Solenoid
RB2009AX	PCBA - (Opto Sense Point)
RB2009BX	PCBA - (Opto Sense Point Zero)
RB2009CX	PCBA - (Opto Sense Ball Count)
RB2009X	PCBA - (Opto Sense Point 10K)
CC2027	20 Ft. Computer Style Power Cord
AR2028X	Ball Eject P.C. Board (AR Model)
RB2034X	Main P.C. Board Assembly
DD2007X	Power Module
2111	Solid State Relay
2426	12 Ft. Modular Phone Cord
HH5005	Ticket Dispenser (Entropy)
PC20224	Counter, 12 Volt D.C.
PC20429	Red Diffused L.E.D.

15



REV 2		ICE Inc.	
Prepared ESI 05-05	Checked ESI 05-05	Roller Main	
Engineer ESI 05-05		MAIN LOGIC P.C.B.	
sizecode	id	drawing no.	
no.			
scale			sheet 1 of 1



Contacts at SEGA

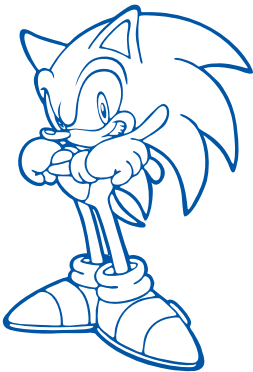


Machine Sales

Telephone: +44 (0) 208 391 8090

Fax: +44 (0) 208 391 8099

www.sega-amusements.co.uk



SEGA Spares

Telephone: +44 (0) 208 391 8060

Fax: +44 (0) 208 391 8096

www.segatotalsolutions.com

Customer Services

Telephone: +44 (0) 208 391 8065

Fax: +44 (0) 208 391 8096