Quick Silver System Games

AWESOME RAT
AWESOME LOOP
HI TENSION

Installation / Owner's Manual

SEGA ENTERPRISES, INC.

Manual Part No. X1501
NOTE: This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

WARNING

The following servicing instructions are for use by QUALIFIED PERSONNEL ONLY. To avoid personal injury or damage to the equipment, DO NOT perform any servicing other than what is specified in this manual.

IMPORTANT

PLEASE READ THIS MANUAL CAREFULLY PRIOR TO SET-UP, INSTALLATION, OR USE OF THIS PRODUCT FOR BEST RESULTS

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# TABLE OF CONTENTS

## INTRODUCTION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Purpose</td>
<td>4</td>
</tr>
<tr>
<td>Product Statement</td>
<td>4</td>
</tr>
<tr>
<td>Basic Description of Game</td>
<td>4</td>
</tr>
</tbody>
</table>

## GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Features</td>
<td>5</td>
</tr>
<tr>
<td>Game Play Instructions</td>
<td>5</td>
</tr>
<tr>
<td>Award Determination</td>
<td>5</td>
</tr>
</tbody>
</table>

## SPECIFICATIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Machine Dimensions/Weight</td>
<td>6</td>
</tr>
<tr>
<td>Electrical Specifications</td>
<td>6</td>
</tr>
<tr>
<td>Environmental</td>
<td>6</td>
</tr>
</tbody>
</table>

## BASIC SET UP PROCEDURES

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping / Moving the Unit</td>
<td>7</td>
</tr>
<tr>
<td>Set Up Adjustments</td>
<td>8</td>
</tr>
<tr>
<td>AC Power Up</td>
<td>9</td>
</tr>
<tr>
<td>AC Power Down-Emergency</td>
<td>9</td>
</tr>
<tr>
<td>AC Normal Power Down Procedure</td>
<td>9</td>
</tr>
</tbody>
</table>

## MACHINE FUNCTIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Switch &amp; Fuse Locations</td>
<td>10</td>
</tr>
<tr>
<td>AC Board and Fuses</td>
<td>10</td>
</tr>
<tr>
<td>Fuse Ratings</td>
<td>10</td>
</tr>
<tr>
<td>Award and Other Switches</td>
<td>10</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>COMPONENTS - REMOVAL &amp; INSTALLATION</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Playfield Glass, Upper &amp; Display Marquee Panels</td>
<td>11</td>
</tr>
<tr>
<td>Ticket Dispenser</td>
<td>12</td>
</tr>
<tr>
<td>Joystick</td>
<td>13</td>
</tr>
<tr>
<td>Coin In/Verifier</td>
<td>14</td>
</tr>
<tr>
<td>Ball Pick-up Return System</td>
<td>14</td>
</tr>
<tr>
<td>Playfield</td>
<td>15</td>
</tr>
<tr>
<td>Ball Return Pan</td>
<td>15</td>
</tr>
<tr>
<td>Ball Return Board</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MICROPROCESSOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Functions</td>
<td>16</td>
</tr>
<tr>
<td>Error Codes - L.E.D. Display</td>
<td>16</td>
</tr>
<tr>
<td>Memory (Tickets)</td>
<td>17</td>
</tr>
<tr>
<td>Power Supply</td>
<td>17</td>
</tr>
<tr>
<td>Sound</td>
<td>18</td>
</tr>
<tr>
<td>Option Settings</td>
<td>19</td>
</tr>
<tr>
<td>Test Parameter Functions</td>
<td>22</td>
</tr>
</tbody>
</table>

| LIGHTING                                                 | 24   |

<table>
<thead>
<tr>
<th>MAINTENANCE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Cleaning/ What to Use</td>
<td>25</td>
</tr>
<tr>
<td>Trouble Shooting Guide</td>
<td>25</td>
</tr>
</tbody>
</table>

| COIN COUNTERS AND TICKET METERS                          | 26   |

| SAFETY                                                   | 27   |

| SECURITY                                                 | 27   |

| PARTS LIST                                               | 28   |

| WIRE DIAGRAM                                             | 30   |

| ASSEMBLY DRAWINGS                                         | 31   |
INTRODUCTION

MANUAL PURPOSE

The purpose of this manual is to assist you (the professional service technician) in the installation, operation, and servicing of this product. This manual contains all the necessary information you will need to become properly familiar with this machine, and it was designed to be self-explanatory, easy to use and act as a reference guide.

PRODUCT STATEMENT

SEGA ENTERPRISES, Inc. and Quick Silver Development Company, who provided the research and development on this machine know that products can only reach their maximum potential and gain the resultant customer satisfaction by being reliable and trouble free.

Therefore, extra steps and precautionary measures have been taken in the research and development, the quality control, and testing. Only the highest quality materials and parts are used.

BASIC DESCRIPTION OF GAME

This amusement machine is a unique solid-state mechanical ball-activated game. Its generic machine cabinet allows it to be easily converted for a variety of ball-activated games. They are all non-violent, skill-oriented games that appeal to all ages and gender. The playing concepts are all simple and easily understood. Coins or tokens are inserted which will automatically start the unit and deliver a ball to the playing surface. The player then controls (moves) the ball using hand and eye coordination, via a joystick connected to the game board. All variations (playfields) work on the same principle. Tickets are awarded at the end of a game if the player achieves certain predetermined objectives.
GENERAL INFORMATION

SPECIAL FEATURES

This product highlights the following features:

- Various levels of skill and play (new challenge concepts)
- A full view, fishbowl display action
- Large eye catching illuminated graphics
- Modular component design
- Error detection circuitry
- Error display modes
- Ticket dispenser option
- Fully Metered

GAME PLAY INSTRUCTIONS

Coins/tokens are inserted into the coin mechanism which is attached to an electro-mechanical Coin Verifier. Once the coin has been verified and accepted as legal tender it then trips a "Coin-In" switch which activates the following:

- Coin-In/Token Meter
- Turns on the Ball Pickup unit which puts a ball in play
- Turns on various Sound modes
- Displays various game information pertinent to the play of the game

The game play varies depending upon the model. All games have a play objective with a reward system for obtaining objective.

AWARD DETERMINATION

Each game has a defined factory pre-set Award Schedule which is controlled by the microprocessor. The Operator can change the Award schedule using the keypad on the Controller PCB, and by changing the information on the graphic artwork.
SPECIFICATIONS

OVERALL MACHINE DIMENSIONS / WEIGHT

Unboxed Machine Weight: 175 pounds
Unboxed Overall Dimensions: 24.75 x 31.50 x 59 inches

ELECTRICAL SPECIFICATIONS

Line Voltage: 100 to 120VAC Single Phase
Line Frequency: 60 Hz

Power Consumption:

AMPS PER MACHINE

Main Ball Feed Drive Motor .440
Power Supply (Single) 1.00
Single Ballast Top Sign .625
Single Ballast Game Surface .625

Total Worst Case Current Requirement: 2.7 AMPS

Current Protection: Main and Individual fusing for each circuit.

Power Cord Receptacle: UL Rated
Power Supply: Single +12VDC UL Rated

ENVIRONMENTAL

Temperature: Operating: 32 F-95 F
0 C-35 C
Storage: 32 F-150 F

Humidity (Relative): Operating: 10%-90%
Non-Condensing: Storage: 00%-95%
BASIC SET-UP PROCEDURES

IMPORTANT - Read this manual carefully prior to set-up and installation of this product for best results.

Every effort has been made to make this product operator / user friendly (easy to inspect and install) in a minimal amount of time and effort.

SHIPPING / MOVING THE UNIT

This product has been designed in a modular fashion and is shipped assembled. To assist in moving, the base frame of this machine was designed to be lifted by a hand cart from the rear.

Immediately after delivery and uncrating of the machine, a physical inspection should be conducted to ascertain any missing or damaged material.

Everything necessary to operate/play the machine will be included in the container sent. You need only to supply basic hand tools for set up/ installation.

Specifically you will need to:

- Check the exterior of the machine to verify that the machine is free from scratches, chips, blemishes and any mechanical damage.
- Check the glass for proper alignment, scratches and cracks.
- Check the interior of the machine, making sure none of the components are disconnected or loose.
- Open the Display Door and make sure the Printed Circuit Boards are securely connected to harnessing wires and that they are properly routed and secured.
BASIC SET UP PROCEDURES

0 This machine is designed for indoor installation. It should not be installed anywhere outdoors.

0 Avoid locations subjected to direct sunlight, high temperature, humidity, violent vibrations, dust, etc. Also avoid locations where dangerous objects or fire fighting apparatus are stored. Be sure not to block an emergency exit.

0 This machine was designed to be installed on a flat surface.

0 Prior to plugging the unit in, review AC Power Up procedures (See Page 9)

0 When the machine is switched on, it will test itself and any malfunctions will be indicated to the attendant on the "ERROR" code. See the "ERROR" code clause for explanation on Page 16.

0 Make sure the machine is well ventilated and meets environmental specifications.

Whenever connecting the solid-state module power cord to, or when disconnecting it from the outlet, be sure to turn the Power switch OFF.

BE SURE TO USE RATED FUSES

SET-UP ADJUSTMENTS

The following information is provided to aid in the installation of this machine and the necessary adjustments that it entails.

You must insure the machine is level from left to right, and tilted slightly forward. To do this, place a "carpenters level" on top of viewing glass, and adjust each of the four leg levelers as necessary.

Once the above has been performed, your machine is ready to operate. Please continue to read all information and instruction contained in this manual prior to applying power to the unit.
BASIC SET UP PROCEDURES

AC POWER UP PROCEDURES

DO NOT APPLY POWER TO THE UNIT UNTIL THE FOLLOWING HAS BEEN COMPLETED:

Upon receiving your unit, check to insure:

1. Assure that the Main Power Switch is in the "OFF" position.
2. The grounding terminal provided on the machine should be connected to "earth ground" without exception.
3. Pull each fuse out of the Main Power Panels to insure correct fuse rating. (See panel cover for proper rating).
4. Check to insure AC power cables to the Main Ball Feed Motor, lights and power supply are securely connected.
5. Plug unit in AC power outlet.
6. Turn Main Switch "ON" sequence.

AC POWER DOWN - EMERGENCY

In an emergency, simply pull the AC line plugs or throw the central cabinet Main Power Switch to the "OFF" position.

Note: This will turn power OFF to the entire unit.

NORMAL POWER DOWN PROCEDURES

Go to Power Panel on the Rear of the machine and turn the Main Power Switch "OFF".

NOTE:

YOUR MACHINE HAS BEEN PRESET AT THE FACTORY FOR RECOMMENDED GAME OPTIONS AND SETTINGS. TO CHANGE THESE OPTIONS, REFER TO PG. 19 OF THIS MANUAL.
MACHINE FUNCTIONS

MAIN SWITCH AND MAIN FUSE LOCATIONS

There is one Main Power ON/OFF Switch located on the back of the cabinet's upper right hand side, which can be operated from the outside of the cabinet. Note: The Main Power Switch turns all electricity ON or OFF to all areas of the machine. The Main Fuse is located internally on the cabinet floor, underneath the protective plastic cover.

AC BOARD AND FUSES

Access to the Printed Circuit Boards is through the Display Panel Door from the front of the machine. The Power Distribution PCB is labeled for easy identification of components.

FUSE RATINGS

<table>
<thead>
<tr>
<th>Component</th>
<th>Rating</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Fuse</td>
<td>5.0 Amp</td>
<td>Only use proper rated fuses</td>
</tr>
<tr>
<td>Power Supply</td>
<td>1.0 Amp</td>
<td>for each component. Warranty for</td>
</tr>
<tr>
<td>Ball Driver Motor</td>
<td>0.5 Amp</td>
<td>product is void if components are</td>
</tr>
<tr>
<td>Rope Lighting</td>
<td>1.0 Amp</td>
<td>improperly fused.</td>
</tr>
</tbody>
</table>

AWARD AND OTHER SWITCHES

**Coin-In Switch:** Located attached to the Coin/Token-In Verifier assembly. This switch activates the unit and puts it into a 'ready to play' mode when a coin/token is inserted.

**Start Switch:** Located on the right front portion on the unit. This switch activates the game.

**Award Switches:** Located as part of the Ball Pan Return unit and on the physical Playfield, depending on the kit installed. These switches trigger inputs to the microprocessor to keep track of the player's skill level. (points/laps ... etc.)

**Ticket-Out Switch:** Located on the Ticket Dispenser. Note: It is an optical switch.

**Ball Feed Switch:** Located as part of the Ball Feed unit. After the Ball Feed Motor is activated, this switch is an input switch to the microprocessor. When operated, the processor puts a signal to a power relay which controls and turns off the Ball Feed Motor.
COMPONENTS - REMOVAL AND INSTALLATION

This section on basic components contains: a description or general statement, how to remove and install, disassemble and reassemble instructions where appropriate, and adjustment information where necessary. Also it makes known what tools, if any, are required to service each component.

PLAYFIELD GLASS, UPPER & DISPLAY MARQUEE PANELS

This machine contains three (3) separate panels.

Tools required are a Flat Screw Driver and Allen Wrench

TO REMOVE the PLAYFIELD GLASS PANEL, proceed as follows:

1) Turn off the Main Power Switch and open the Front Door panel.

2) Remove the Front and Rear trim strips that secure the glass by loosening the two (2) wing nuts on the underside of each trim strip.

3) Remove the Joystick Knob by loosening the set screw on the knob using an Allen Wrench. Then, unscrew and remove the knob from the shaft.

4) Remove the Ball Return Pan by removing the two (2) thumb screws. Pull the front of the pan slightly down and out.

5) Use a flat screw driver to unbolt the Joystick Mounting Bracket (two upper 3" bolts). Lower the Joystick unit intact.

6) Slide the Playfield Glass out of its holding tracks.

TO REMOVE the DISPLAY MARQUEE PANEL, proceed as follows:

1) Turn off the Main Power Switch. Unlock and open the Display Marquee Panel.

2) Remove the metal trim strip, using a 3/8" wrench to unbolt the (2) nuts from the rear of unit while holding the trim strip to the unit.

3) By pulling the Panel upward, the Panel will come out of it's secured cabinet holding position.
COMPONENTS - REMOVAL AND INSTALLATION

TO REMOVE the UPPER MARQUEE PANEL, proceed as follows:

1) Turn off the Main Power Switch.

2) Using a T20 Tamper Proof Wrench, remove the (2) screws on the top and bottom trim strips. Pull the Upper Marquee Bracket and Graphic Panel UP out of the cabinet.

TO INSTALL the various PANELS, proceed as follows:

1) Clean glass/plastic panels if necessary.

2) Firmly hold glass/plastic panels with both hands, carefully insert panels into holding tracks/supports.

3) Follow the reverse directions of removal instructions.

TICKET DISPENSER

Removal & Installation Tools Required = 3/8" Wrench

TO REMOVE the TICKET DISPENSER, proceed as follows:

1) Turn off Main Power Switch.

2) Unlock the Front Door.

3) Disconnect the 4 pin wire Connector.

4) Remove any unused tickets from unit.

5) Hold the Ticket Dispenser with one hand to prevent the Dispenser from falling out. Remove the four (4) nuts which fasten the unit to the door.

TO INSTALL the TICKET DISPENSER, proceed as follows:

1) With both hands, place the unit in its mounting position and secure with given hardware.

2) Connect the 4 pin wire Connector.

3) Feed tickets into unit, then close and lock the Front Door.
COMPONENTS - REMOVAL AND INSTALLATION

JOYSTICK

This machine utilizes a special Joystick made up of a Controller Shaft Assembly, Controller Shaft Balance Assembly and Linkage, and Knob. (These parts are factory assembled and have no adjustments).

Removal and Installation Tools Required = Allen Wrench and a Flat Screw Driver

TO REMOVE the JOYSTICK, proceed as follows:

1) Turn off the Main Power Switch.

2) Unlock and open the Front Door.

3) Remove the Joystick Knob using an Allen Wrench to loosen the set screw.

4) The Playfield Glass and Playfield must be removed for access. (See Page 12).

5) Once the Playfield Glass has been removed, proceed to remove the (8) 6-32 screws that secure the Joystick Frame to the Cabinet Bracket.

6) Grasp the Joystick Assembly firmly, and remove the Joystick through the front Cabinet door area.

TO INSTALL the JOYSTICK, proceed as follows:

1) Clean and lubricate as necessary.

2) Follow removal instructions in reverse.
COMPONENTS - REMOVAL AND INSTALLATION

COIN-IN VERIFIER

Removal and Installation Tools Required = None

TO REMOVE the COIN-IN VERIFIER, proceed as follows:

1)  Turn off the Main Power Switch and open Front Door.

2)  Remove the unit by hand.

(Note: Coin reject solenoids are not used on this model.)

TO INSTALL the COIN-IN VERIFIER, proceed as follows:

1)  Clean, repair and adjust as necessary.

2)  Install the unit in the front door.

Note: The Coin Verifier unit may be removed independently, without taking out the entire assembly.

BALL PICK-UP RETURN SYSTEM

This system is what places a game ball onto the Playfield.

The Ball Pick-Up Return System is controlled by the microprocessor. When inputs to the microprocessor indicate a ball is to be dispensed, the microprocessor puts out a signal to a normally closed +5VDC/110VAC relay which turns on the ball pick-up/return system motor. The motor stays on until the Ball Feed Switch is activated, and then turns off 3 seconds later.

TO REMOVE system MECHANICAL PARTS, proceed as follows:

1)  Turn off Main Power Switch.

2)  Unlock and remove the back door.

3)  Disconnect the 110V electrical plug connectors on the AC Board, and the ball feed switch wires.

4)  Remove the four (4) 10-32 screws located on the back panel wall.
COMPONENTS - REMOVAL AND INSTALLATION

TO INSTALL SYSTEM MECHANICAL PARTS, proceed as follows:

1) Clean and repair as necessary.

2) Follow the removal instructions in reverse order.

TO REMOVE SYSTEM PLAYFIELD, proceed as follows:

1) Remove Playfield Glass (See Pg. 11 for Removal Instructions).

2) Securing the Playfield are 4 spring clips (2 on each side). Push the clips outward (toward the cabinet wall) on one side of the Playfield, and carefully lift upward and out.

TO INSTALL SYSTEM PLAYFIELD, proceed as follows:

1) Clean and repair as necessary.

2) Follow the removal instructions in reverse order.

BALL RETURN PAN

The Ball Return Pan houses four (4) separate award switches and is constructed in such a manner to also feed balls to the Ball Pick-up Return system. If a switch needs to be replaced, it is easiest to remove the pan first before replacing a switch.

(Note: Three (3) screws secure it to the interior cabinet wall.)

BALL RETURN BOARD

The Ball Return Board funnels balls that fall off of the Playfield to the Ball Return Pan. This pan is divided into four (4) parts and is designed to direct balls into the proper award switch.

The board is easily removed by turning the two hold down wingnuts counter clockwise (located on the front edge of pan) and then pulling the pan forward and out.
MICROPROCESSOR

FUNCTIONS

The processor continuously monitors 9 different switch closure activities.

Switches Monitored:

1. Award Switch 1
2. Award Switch 2
3. Award Switch 3
4. Award Switch 4
5. Award Switch 5
6. Coin-In Switch
7. Ball Feed Switch
8. Start Switch
9. Ticket Out Switch

The microprocessor is designed to monitor and register input switch closures and pay out tickets during game play after award criteria is met.

Additionally, the processor is designed to give input signals to non-resetting, coin-in and ticket-out meters.

ERROR CODES - L.E.D. DISPLAY

The following ERROR CODES will appear on the large red L.E.D display under the following conditions:

The Large Red L.E.D. Display will show an error message of:

<table>
<thead>
<tr>
<th>Message</th>
<th>Cable Jack</th>
<th>Switch Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLPO = Out of Tickets</td>
<td></td>
<td>Ticket Door Panel</td>
</tr>
<tr>
<td>HLP1 = Award Sw #1 Malfunction</td>
<td>J1-2</td>
<td>Ball Pan Rt. Rear</td>
</tr>
<tr>
<td>HLP2 = Award Sw #2 Malfunction</td>
<td>J1-3</td>
<td>Ball Pan Rt. Front</td>
</tr>
<tr>
<td>HLP3 = Award Sw #3 Malfunction</td>
<td>J1-4</td>
<td>Ball Pan Lt. Front</td>
</tr>
<tr>
<td>HLP4 = Award Sw #4 Malfunction</td>
<td>J1-5</td>
<td>Ball Pan Lt. Rear</td>
</tr>
<tr>
<td>HLP5 = Award Sw #5 Malfunction</td>
<td>J1-6</td>
<td>Frt. Interior Wood Wall</td>
</tr>
<tr>
<td>HLP7 = Ball Out Sw/Motor Malfunc</td>
<td></td>
<td>Ball Pickup Assembly</td>
</tr>
</tbody>
</table>

NOTE 1: "OUT OF TICKETS" (HLPO) is displayed at the end of the current game run mode. When tickets are loaded, owed tickets will be dispensed, and the display will revert to normal.

NOTE 2: All switch malfunctions are only cleared by power-up initialization.
MICROPROCESSOR

MEMORY (Tickets)

In the event the Ticket Dispenser runs out of tickets while it is in a 'pay out' mode, the processor has a memory RAM. The machine will return to the condition/state where it left off, provided that the problem has been corrected (ie: refilled tickets). Also, The L.E.D. will display "HLPO" error code which indicates "Out of Tickets". The unit will now be back to normal.

POWER SUPPLY

A single Power Supply (3.4 amp) is used for driving the following +5VDC items:

- The Processor
- The L.C.D. Display
- The Ball Feed Motor System Relay
- The Input Signals into the Processor

The Power Supply Features are:

- Low Noise and Ripple; EMI Filter
- Over Voltage Protection
- Accepts 115VAC or 230VAC Inputs
- Short Circuit Protection
- High Efficiency
- UL Recognized / CSA Certified

Adjustments: The voltage may be adjusted using the voltage control pot (R-8-v. adj.) located on the printed circuit board on the front of the power supply. Due to varying input line voltages, the supply should be checked and set for +12VDC.

The Power Supply Specifications are:

- Voltage AC Input: 115/230 VAC (+/-) 10%
- Output +12 VDC: 3.4 amps
- Line Regulation: +/- .05% for a 10% change
- Load Regulation: +/- .05% for a 50% load change
- Output Ripple: 5.0 MV pk-pk max.
- Temperature Rating: 0 - 50 degrees Centigrade fully rated; de-rated linearly to 40% @ 70 C.
MICROPROCESSOR

SOUND

The sound system is composed of the following:

- One 5-1/4" 8 ohm Speaker located in the Upper Marquee area.
- Speaker Cable J-1 connects the speaker to the CPU Board J9.
- An Audio Amplifier located on the CPU Board

The sound system is designed to generate the following Audio signals:

- A **Coin-In** audio tone each time a coin is inserted.
- A **Ball Out** audio tone for each ball dispensed on game board.
- An **Award Point** audio tone for each award.
- An **Attraction** audio tone.
- A **Game Theme** audio tone when the game is in play.

ADJUSTMENTS

The Audio Volume Control adjustment is located on the CPU Board. Turn the control clockwise to increase, and counter clockwise to decrease sound volume. Note: The audio control is marked "POT 2" and is located on the bottom right hand side of the CPU Board.

TROUBLE SHOOTING CHECKLIST

If you experience no sound on coin-in, check the following:

- Coin-In switch
- Sound speaker wiring
- Sound control adjustment
MICROPROCESSOR

OPTIONS - GAME BOARD OPTION SETTINGS

To set the options you must first power the game down, then power it up to make sure there are no credits pending on the game. Use the Main Power switch on the back of the unit.

<table>
<thead>
<tr>
<th>CPU Key Pad Arrangement</th>
<th>PROGRAM</th>
<th>NEXT</th>
<th>ENTER</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4</td>
<td></td>
<td></td>
<td>PROGRAMMING</td>
</tr>
<tr>
<td></td>
<td>5 6 7 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RUN</td>
<td>LAST</td>
<td>EXIT</td>
<td>DECREASE</td>
</tr>
</tbody>
</table>

1. In the RUN 5, the LCD display will read "COINS=____." This will represent the number of coins received by the game to date.

2. By pressing the NEXT 2 button twice, you will bring up "TICKETS" issued to date.

This is the extent of the accounting functions

3. To set the price per game press the PROGRAM 1 button once. It will display "SET COSTS/GAME". To set the values, you must press the NEXT 2 button. "1 GAME/COINS=01" will appear on the LCD.

Your game will be pre-set to the factory recommended settings. If you wish to change the settings, you must go through 12 GAME/COINS=____ settings and you will need to press the NEXT 2 button to go from "1 GAME/COIN=____" to "2 COIN/GAME=____" and so on until "12 COIN/GAME=____" is reached.
**MICROPROCESSOR**

**OPTIONS - GAME OPTION SETTINGS**

See below for an example of how to change the settings.

<table>
<thead>
<tr>
<th>EX: EXAMPLE</th>
<th>1 COIN/GAME ($25)</th>
<th>2 COIN/GAME ($50)</th>
<th>3 COIN/DOLLAR ($50/game)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Game/Coin=</td>
<td>01</td>
<td>02</td>
<td>00</td>
</tr>
<tr>
<td>2 Game/Coin=</td>
<td>02</td>
<td>04</td>
<td>00</td>
</tr>
<tr>
<td>3 Game/Coin=</td>
<td>03</td>
<td>06</td>
<td>04</td>
</tr>
<tr>
<td>4 Game/Coin=</td>
<td>04</td>
<td>08</td>
<td>06</td>
</tr>
<tr>
<td>5 Game/Coin=</td>
<td>05</td>
<td>10</td>
<td>08</td>
</tr>
<tr>
<td>6 Game/Coin=</td>
<td>06</td>
<td>12</td>
<td>08</td>
</tr>
<tr>
<td>7 Game/Coin=</td>
<td>07</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>8 Game/Coin=</td>
<td>08</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>9 Game/Coin=</td>
<td>09</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>10 Game/Coin</td>
<td>= 10</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>11 Game/Coin</td>
<td>= 11</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>12 Game/Coin</td>
<td>= 12</td>
<td>24</td>
<td>16</td>
</tr>
</tbody>
</table>

**OPTIONS - AWARD VALUE SETTINGS (MAZE TYPE)**

To set the Playfield Award values (number of Tickets to be dispensed per Playfield area), you must first power the game down and then up again to make sure there are no credits pending. Use the Main Power Switch the back of the unit.

<table>
<thead>
<tr>
<th>CPU Key Pad Arrangement</th>
<th>PROGRAM</th>
<th>NEXT</th>
<th>ENTER</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

To set the Awards for each game type you must first be in the "SET PARAMETERS" mode. To do this, press the PROGRAM 1 button four (4) times It will display "SET PARAMETERS". To set the Award values, press the NEXT 2 button five (5) times. It will display "AWARD 1=XX". The INCREASE or DECREASE buttons (#4 & #5) along with the ENTER or EXIT buttons (#3 & #6) will enable you to set the Award amount. Press the NEXT button #2 and set the second Award amount, and etc. until all 5 Award amounts are set.
MICROPROCESSOR

OPTIONS - AWARD VALUE SETTINGS (MAZE TYPE)

To change the number value you must press the "INCREASE 4" or the "DECREASE 5" buttons. To move the cursor you must press the "ENTER 3" or "EXIT 6" button which also serves as the cursor locator in this function.

4. Press the PROGRAM 1 button two more times and "TEST FUNCTION" will appear on the display.

5. Press the PROGRAM 1 button once more and "SELECT GAME" will appear. Press NEXT 2 once and Game Type (ie: GAME=MAZE) will appear. This will tell you which game EPROM is being used in your game system.

6. Again, press the PROGRAM 1 button and "SET PARAMETERS" will appear on the display. This mode holds the options settings except for the cost per game.

To set any option to a desired number, you must press the INCREASE 4 or DECREASE 5 button until the desired setting is shown on the display. To move the cursor, (it blinks on the digit it will change) you must press the ENTER 3 button, which will move the cursor to the left, or press the EXIT 6 button which will move the cursor to the right. Once an option is set as desired, press the NEXT button to go on to the next option. If all options are set to your satisfaction, press the RUN 8 button twice to return to the operation mode. See the following for the order:

A.  MAZE
B.  ATT.REPEAT = ___ ...........(Allows the attract mode to be set on any repeat interval. To cancel the attract mode, set the time to 00. The attract mode will not operate if there are credits pending on the game.)
C.  BALLS PER GAME
D.  MAX>TKT>GAME = ___.......(Maximum tickets that can be displayed per game regardless of score.)
E.  AWARD (1-5)
F.  BELL ON
G.  FREE GAME ENABLE...........NOT USED
H.  MAX FREE GAMES .............NOT USED
I.  FIRST FREE GAME .............NOT USED
J.  FREE BALL ENABLE............NOT USED
K.  MAX FREE BALLS ..............NOT USED
L.  FIRST FREE BALL .............NOT USED
MICROPROCESSOR

TEST PARAMETER FUNCTIONS

Press RUN 5 to go back to idle play mode. All components can be tested using the following parameters:

1. To access "TEST" functions parameter press the PROGRAM 1 button three times until TEST FUNCTIONS appears. (To exit the "TEST" function press EXIT 6 button).

2. The "TEST" buttons are in a loop, therefore, press NEXT or LAST buttons until desired test is displayed on the Liquid Crystal Display.

LED Display Test:
Press ENTER 3 button; LED will cycle through all possible numerical combinations. The test will loop cycle until the EXIT 6 button is pressed. (Press EXIT then NEXT to continue).

Sound Test:
Press ENTER 3 button. "Theme Song" will appear on the LCD. Press ENTER 3 button again and the Theme Song will play. The remaining sounds will be displayed in the following order each time the NEXT 2 button is pressed:

- Coin-Up
- Start Game
- Bonus Time
- Attract Sound
- Scoring Sound (1-5)
- Spare Sound
- Non Score Sound (1-4)

(Press EXIT then NEXT to continue).

Memory Test:
Press ENTER 3 button; LCD will display "Testing Memory". After this test is complete, the LCD will display "Memory OK" or "Memory Bad". (Press EXIT then NEXT to continue).
MICROPROCESSOR

TEST PARAMETER FUNCTIONS

Ticket Test:
Press ENTER 3 button, then the INCREASE 4 button. The LCD will display "Tickets Good" and issue one ticket, or "Ticket Mech. Bad" if the ticket mechanism is malfunctioning for any reason. (ie: out of tickets...etc.) (Press EXIT then NEXT to continue)

Motor Test:
This will test the Ball Pick up Motor. Press the ENTER 3 button, then the INCREASE 4 button and the LCD will display "Motor On" and enable (turn on) the motor. Press the DECREASE 5 button and the LCD will display "Motor Off" and disable (turn off) the motor. (Press EXIT then NEXT to continue).

Dump Ball Test:
Not used. (Press EXIT then NEXT to continue).

Rope Lighting:
Press the ENTER 3 button, then the INCREASE 4 button to turn on the lights; the LCD will display "Ropelight On". Press the DECREASE 5 button and this will turn off the lights; LCD will then display "Ropelight Off". (Press EXIT then NEXT to continue).

Ball Sensor Test:
Press the ENTER 3 button. The LCD will display "Ball Not Seen". When the ball has passed by or through the ball sensor, the LCD will display "Ball Seen". (Press EXIT then NEXT to continue).

Coin-In Switch:
Press the ENTER 3 button. The LCD will display "Input Switch" if operational. (Press EXIT then NEXT to continue).

Start Button:
Press the ENTER 3 button. The LCD will display "Start Button Off". (Press EXIT then NEXT to continue, or RUN 5 to go back to idle play mode).
LIGHTING

All Fluorescent Lighting, located in the Upper Marquee and in the front of the Playfield utilize a ballast which contains the starter. The Rope Lighting, surrounding the Playfield directly under the glass, is 115V and is controlled from the CPU Board through the AC Power Board.

TROUBLE SHOOTING CHECKLIST

0 Check 110V power source (Main Power Panel & Light Fuse)
0 Check Lamps
0 Check Ballast
0 Check ground shield

BALLAST LIGHTS CANNOT BE TURNED OFF AND ON RAPIDLY. YOU SHOULD WAIT 45 SECONDS BETWEEN POWER ON AND POWER OFF.
MAINTENANCE

GENERAL CLEANING

Glass: - Clean with window cleaning solutions.
Plastic Panels: - Clean with Plex/Plastic Polish.
Exterior Metal: - Clean with window cleaning solutions.
Exterior Cabinet: - Clean with all purpose cleaner; then use a
furniture polish if desired.

TROUBLE SHOOTING GUIDE

The following guide is to assist in making a quick diagnosis should a
problem arise. Please note that we cannot over emphasize the
importance of understanding the various electrical circuitry and
mechanical mechanisms which make up this machine.

When trouble arises, follow these steps:

1) Start at the source of the trouble. Replace the suspected faulty
component if (a) you are sure that the replacement part functions
properly and (b) if the new component falls within the
specifications outlined in this manual.

2) Check the voltage on the 12V Power Supply. The Power Supply is
regulated and should not supply less than 7% of the 12V.

3) For the components driven by A/C, check the input on the A/C
board. Then, the output of the switching relays for the correspon-
ding outputs.

4) The switching relays are turned off and on by a 5V signal that runs
to the A/C board. If the corresponding 5V signal is not being
transmitted to the A/C board, check for the presence of the signal
supplied by the CPU board.

5) For the components driven by 5V or 12V, check for the voltage
supplied to the component, at the component end, then at the CPU
board.

6) If the proper voltage is present at the source, but not at the
component, check the wiring for continuity. Re-seat or Re-attach
wiring that is found to be loose or broken.

7) Mechanical failures - check for loose or missing fasteners, wear, or
misalignment.
COIN AND TICKET COUNTERS

Counters are mechanical and electrical devices placed on the machine to count the number of coins that have passed through the verifier and number of tickets paid out of the machine.

The mechanical set of counters are located inside of the LED front panel. The counters are:

| COIN - IN | (TOP COUNTER) |
| TICKET - OUT | (BOTTOM COUNTER) |

Note: Coins that are rejected by the verifier and fall into the front door reject tray are not counted on the Coin-In meters.

TROUBLE SHOOTING CHECKLIST

If the Coin-In Counter is inoperative:

- Check the Coin-In switch
- Check the Coin Counter
- Check the Microprocessor Input/Output
  (See Diagram - Pg. 30)

If the Ticket-Out Counter is inoperative:

- Check the Ticket Counter
- Check the Microprocessor Input/Output
  (See Diagram - Pg. 30)
- Check the Ticket Dispensing unit
SAFETY

This product is approved by UL (Underwriters Laboratory), and has been certified for safety using the standards of UL 22.

SECURITY

ELECTRICAL

- Verifier Coin-In systems
- Shielding of sensitive electrical parts
- Total Coin-In and Ticket-Out accountability
- Memory
- Central Grounding System

There are no bi-directional test points critical to the game functions.

MECHANICAL

- Durable cabinet design and construction
- Quality door locks
- All glass parts are security bolted from the inside
- Solid stainless steel piano hinges on front door
- All doors have door length long stops and backing
- All outer parts have close tolerance dimension
- Mechanical verifier to reject illegal tender
PARTS LIST

E2146 ASSEMBLY, CABINET
C4370 Glass, Playfield Cover
B4411 Speaker Screen
B4406 Bracket, Ball Exit
X112 Speaker, 8 ohm
X0452 Motor 2 RPM
X1122 Power Supply
C4513 Power Supply Shield, FCC
X1123 Transformer, Fluorescent Lighting
B2163 Fluorescent Lamp Hood Assembly
D2149 Deck Level Quarter Section Assembly
X0430 Spherical Ball, Chrome (3/4" Dia.)
C2157-xx Frame Board Latch Assembly
X0427 Ball Control Knob
B2164 Rope Light Assembly
C2169 Coin Door Assembly
X1156 Ticket Dispenser
C4489 Ticket Bin (Double)
X1124 Illuminated Pushbutton, START
X1501 Owner's Manual

PLAYFIELD ASSEMBLY

D2151 Hi Tension
D2173 Awesome Rat
D2165 Awesome Loop

ARTWORK GRAPHICS

C4500 Upper Marquee, Hi Tension
C4503 Upper Marquee, Awesome Rat
C4506 Upper Marquee, Awesome Loop

C4501 Display Panel Graphics, Hi Tension
C4504 Display Panel Graphics, Awesome Rat
C4507 Display Panel Graphics, Awesome Loop

C4502 Control Panel Graphics, Hi Tension
C4505 Control Panel Graphics, Awesome Rat
C4508 Control Panel Graphics, Awesome Loop

B2161 MAIN POWER SWITCH & FUSE
B4482 Plate
X1060 Main Power Switch, ON/OFF
X1074 Fuse Holder
X1112 Fuse, 5 Amp
## PARTS LIST

### ASSEMBLY, DISPLAY & ELECTRONICS
- **C2162**
  - Bracket, L.E.D. Display
- **D4376**
  - PCB, Controller
- **C7001-01**
  - PCB, AC Power
- **X1013**
  - Counter, 6 Digit

### ASSEMBLY, MOTOR PLATE WHEEL PICK UP
- **D2142**
  - Assembly, Motor Wiring Harness
- **C9147**
  - Plate Mounting, Ball Pick Up
- **C4363**
  - Motor Plate, Ball Pick Up
- **C4362**
  - Wheel Ball Pick Up Return
- **B4360**
  - Ball Cam Block
- **B4361**
  - Collar Ball Pick Up Wheel
- **X0667**
  - Micro Switch

### ASSEMBLY, TROUGH CHANNEL
- **C2159**
  - Trough Channel Assy. Weldment
- **D2144**
  - Ball Ball
- **B4434**
  - Shaft, Ball Ball
- **B4396**
  - Bracket, Ball Return Switch
- **X1113**
  - Switch

### ASSEMBLY, JOYSTICK CONTROLLER LINKAGE
- **D2143**
  - Control Shaft Balance Assembly
- **C2148**
  - Controller Shaft Assembly
- **B4383**
  - Control Shaft Linkage
- **C4384-01**
  - Brace Control Right
- **C4384-02**
  - Brace Control Left
- **C4385**
  - Bracket, Deck Mounting
- **B4386**
  - Bracket, Brace Control
- **B4387**
  - Angular Stop
- **X0516**
  - Precision Dowel Pin
- **B4491**
  - Brace, Bracket Deck Mounting

### ASSEMBLY, BRACKET SWITCH BALL ROLL-OFF
- **B2158**
  - Plate, Ball Off Switch
- **B4495**
  - Switch
- **X0656**
  - Bracket, Ball Roll-Off
APPLY ONE DROP TO THREADS & ASSEMBLE AS USUAL.

SECTION Z-Z
MACHINE & CABINET

BACK VIEW OF MACHINE

NOTE:
TYPICAL SWITCH MOUNTING,
ALIGN ACTUATOR ARM WITH CENTER OF SLOT, 4 PLACES.
#30 DRILL (.1285) DRILL THRU SWITCH BLADE

5  /  B4490  BRACKET, SWITCH BALL ROLL OFF
4  /  X0507  POP RIVET 1/8" DIA, 250 - .3/12 GRIP
3  /  X0042  SCREW B.H. * 6-32 X 1/2" LG.
2  /  X0656  SWITCH E23-50H, BALL ROLL OFF
1  /  B4495  PLATE, BALL ROLL OFF SWITCH

NO. - CAUTION FORM LUG UP 90° AS SHOWN
N.C. - TRIM LUG OFF NOT USED