Benchmark ™ **Games, Inc.**
WORLD'S PREMIER GAMES

SuperHoops

OPERATION MANUAL

PLEASE READ FIRST BEFORE PLUGGING IN MACHINE
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120MAN-01-D

AAMA
AMERICAN AMUSEMENT
MACHINE ASSOCIATION

AMOA
Amusement & Music Operators Association

IAAPA
INTERNATIONAL ASSOCIATION OF AMUSEMENT PARKS AND ATTRACTIONS
☆ ☆ ☆
MEMBER

IAFEC
INTERNATIONAL ASSOCIATION OF FAMILY ENTERTAINMENT CENTERS

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MANUAL REVISION HISTORY
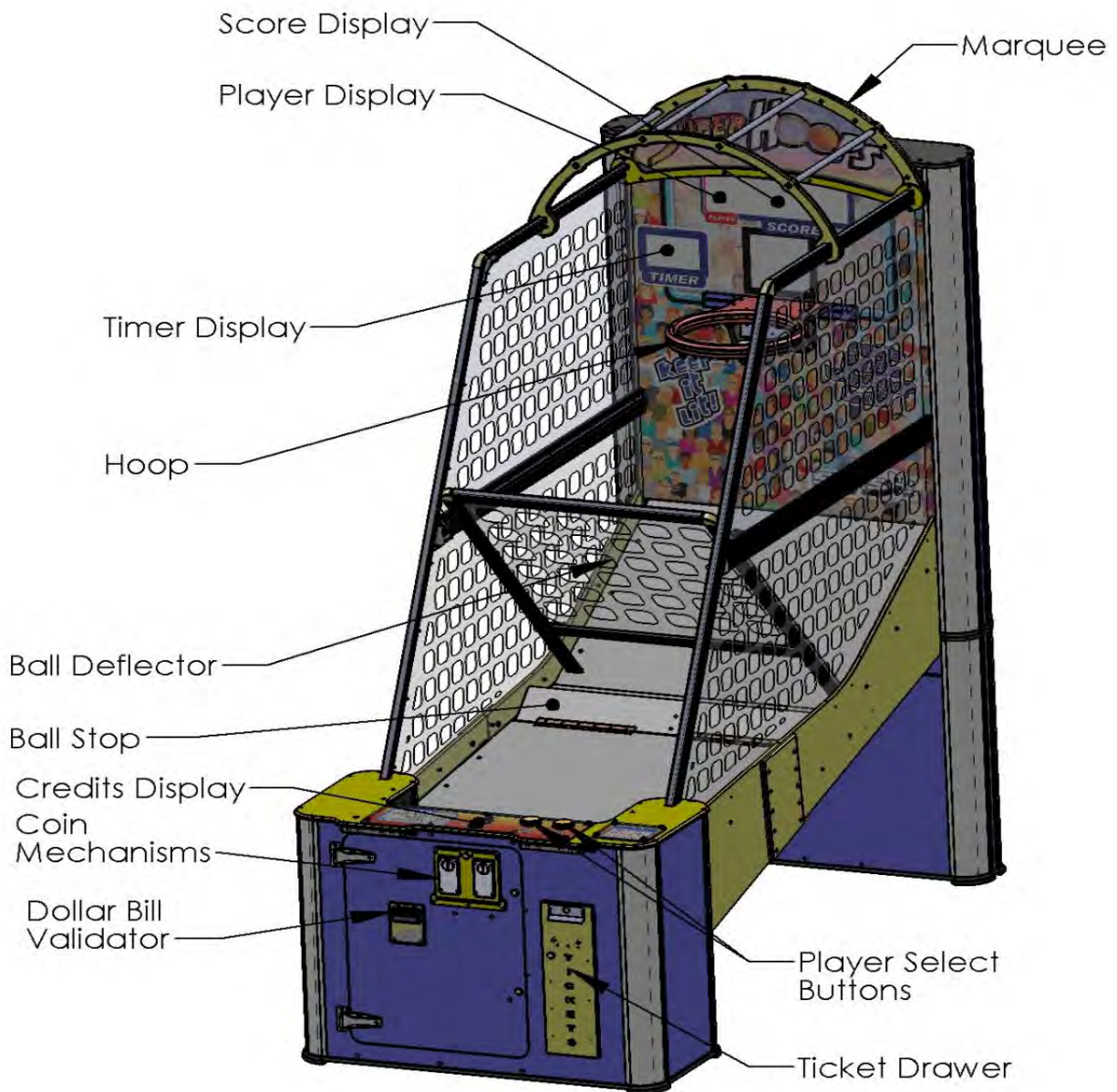
Rev.	Description	Date
A	Release to Production	07/10/12
B	Updated power consumptions and 485 communication	01/4/13
C	Corrected PCB part #s and pictures. Corrected E-code 4	03/04/13
D	Updated assembly instructions, added kid cage instructions, corrected part numbers, added mechanical drawings, update ball stop diagrams	08/20/13

General Game Specifications:

Dimensions: 100-1/4" Long
                         44-9/16" Wide
                         87-1/4"   High
Power Consumption:

1- BASIC COMPONENTS

Score Display

Player Display

Marquee

Timer Display

Hoop

Ball Deflector

Ball Stop

Credits Display

Coin Mechanisms

Dollar Bill Validator

Player Select Buttons

Ticket Drawer

2- GAME PLAY SEQUENCE/BEHAVIOR

I-Power-up initialization Sequence

II- Attraction Mode:
RGB colored lights will pattern on the hoop, side rails and marquee continuously. Score display will toggle last game played score with high score. Timer display will pattern.

III- Buying Credits:
Insert Coins or Bills, or swipe card (if card system) to purchase credits. A 'coin in' sound will indicate input. Amount of credits purchased will show on the 'CREDITS' display. Player buttons will flash alternately.

IV- Play Mode:
Push player button to begin play mode. Ball barrier will recede, allowing balls to roll down to player and a 5 second countdown to play will begin on timer display. A 'GO' sound will indicate when it's time for the player to start shooting along with the Timer Display beginning the game time countdown.

V- Scoring:
When play begins the hoop is not lit. Any time the hoop is not lit and a basket is scored, the player will be awarded 2 points. .
     Level 1: During level 1, after the player makes a shot, the hoop will light blue for a short period of time. If the player makes a shot before the blue lights go out, that shot will be worth 3 points and the hoop light time will be reset allowing the player to again try for a 3 point shot. As long as the player continues to make consecutive shots quickly it is possible to keep the rim lit blue and make several 3 point shots in a row.
     Level 2-4: Once a player reaches level 2, there is no longer a blue 3 point opportunity. Instead, the rim will turn red after each shot and the value of a basket while red is 4 points. If the player makes 5 consecutive red shots in a row, the hoop turns purple when shots will be worth 10 points. When the player fails to make a shot quickly after the previous shot the hoop will reset to unlit and the next shot will be worth 2 points as the cycle will start over.

VI- Levels:
There are 4 possible levels for a player to reach. Each level must be qualified for with a programmable score. For example, according to the default settings, a player will need 50 points in the first level to be allowed to extend the game into level 2. If 50 points are not reached the game is over.

3- GAME SETUP
## *Unloading/Assembly*

1. **Unpack machine from crate.**
   Here is a list of the parts you will have:

| Qty.	Description	Part #	Item #
1 ---1 ---1 ---8 ---8	Backboard Assy • Backboard Upper Assy. • Backboard Lower Assy • #10x1.5" carriage bolts • #10-24 kep nuts	120ASM006 120ASM005 120ASM002 HAR40008 HAR35002	1 1a 1b 1c 1d
1	Basketball Control Tower	120ASM014	2
1 - --1 ---1 ---1 ---1 ---1 ---1 --16 ---4 --20	Platform Assy. • Main Platform Forward • Main Platform Rear • Platform Side Trim Splice • Mirror Platform Side Trim Splice • Platform Side Support Plate Splice • Mirror Platform Side Support Plate Splice • #10x2.5" Carriage Bolts • #10x1.25" Carriage Bolts • #10-24 Kep Nuts	120ASM001 120ASM015 120ASM016 120MAC085 120MAC087 120MAC086 120MAC088 HAR40012 HAR35002	3 3a 3b 3c 3d 3e 3f 3g 3h 3i
1	Side Net Assembly	120ASM032	4
1	Side Net Left Assembly	120ASM033	5
1	Side Net Lower Assembly	120ASM034	6
1	Side Net Lower Left Assy	120ASM035	7
1	Ball Deflector Net Assy	120ASM031	8
1	Extruded Rail Front Assy	120ASM036	9
1	Extruded Rail Front Left Assy	120ASM037	10
2	Platform Capture Plate	120MAC048	11
1	Net Lower Rod Capture Plate	120MAC049	12
1	Mirrornet Lower Rod Capture Plate	120MAC050	13
1	Top Net Bracket	120ASM021	14
6	Rail Lock Plate	120MAC095	15
36	Acorn Nut, ¼-20	HAR30002	16
16	¼-20 x ½" hex bolt	HAR43009	17
12	#10-32x1-1/4"" machine screws	HAR11024	18
14	#10x1/2" sheet metal screws	HAR13002	19
10	#10x1-1/2" carriage bolts	HAR40008	20

2. Build the Backboard Assembly (skip this step if preassembled).

- Attach Backboard Upper Assembly to Backboard Lower Assembly using (10) #10 x 1.5" carriage bolts and (10) #10-24 kep nuts.

| ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	120ASM005	backboard upper assembly	1
2	120ASM002	backboard lower assembly	1
3	carriage bolt #10x1.500	carriage bolt	10
4	#10 Kep Nut	#10 Kep Nut	10
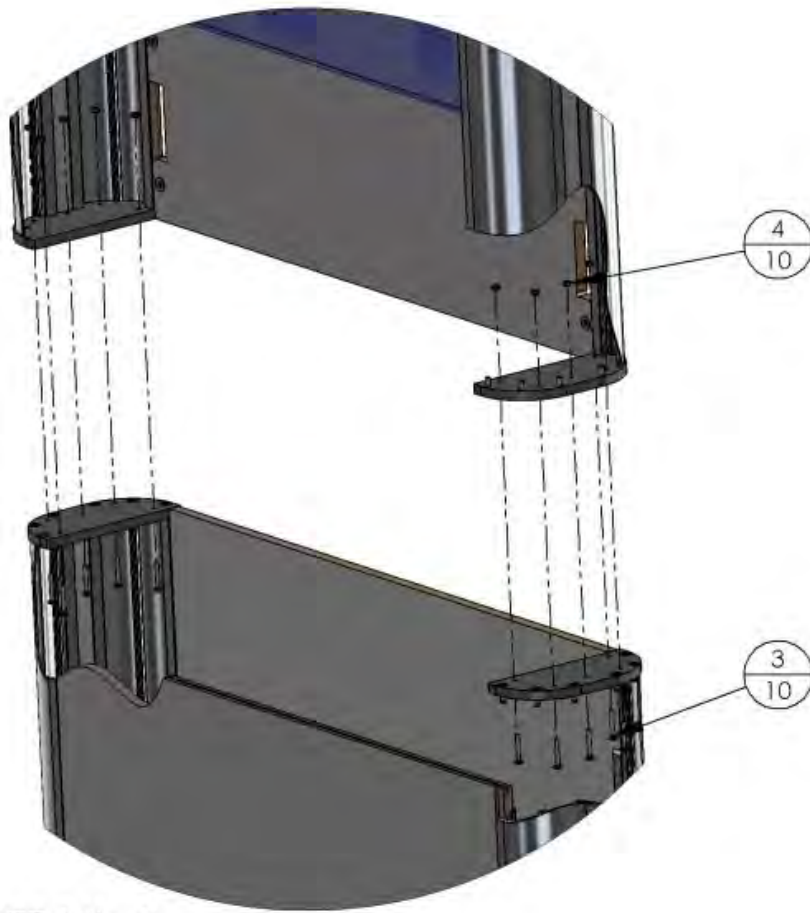
DETAIL A
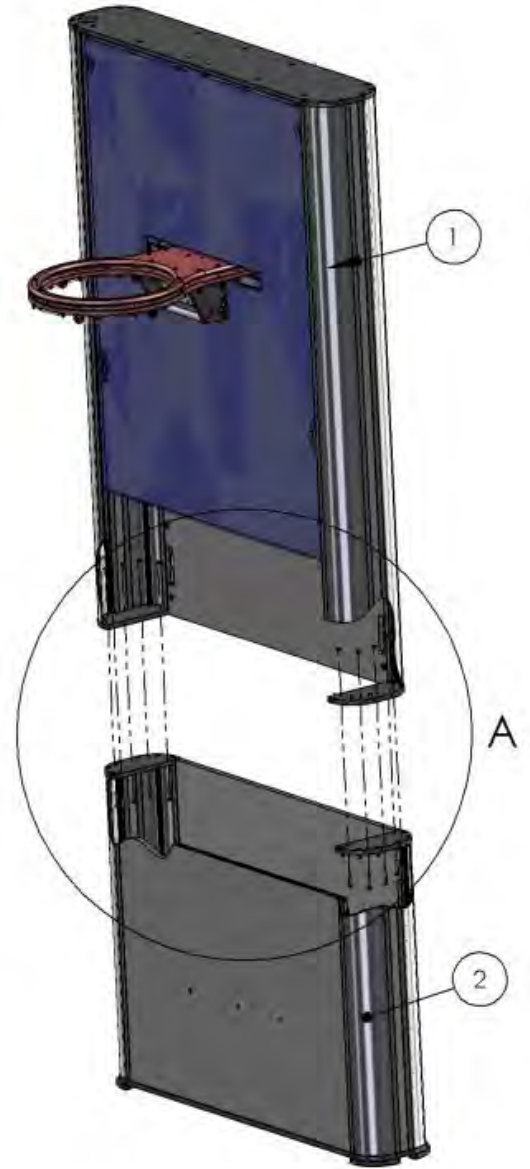
3. Build Platform Assembly and Attach Ball Stop Cam (skip this step if preassembled)

- Remove 'Ball Stop Motor Cover' by removing (6) Attaching Screws and lifting off
- Attach Ramp Spring as shown
- Attach harness between forward and rear platform
- Replace 'Ball Stop Motor Cover' using (6) attaching screws

ITEM NO.	PART NUMBER	DESCRIPTION	Explode 1/ QTY.
5	120MAC085	platform side trim splice	1
6	120MAC088	mirrorplatform side support plate splice	1
7	120MAC087	mirrorplatform side trim splice	1
8	carriage bolt #10x2.500	carriage bolt	16
9	carriage bolt #10x1.250	carriage bolt #10x1.250	4
10	#10 Kep Nut	#10 Kep Nut	20
11	120ASM015	main platform forward	1
12	120ASM016	main platform rear	1
13	120MAC086	platform side support plate splice	1

Ball Stop Motor Cover (Remove for access)

Attach Spring as Shown
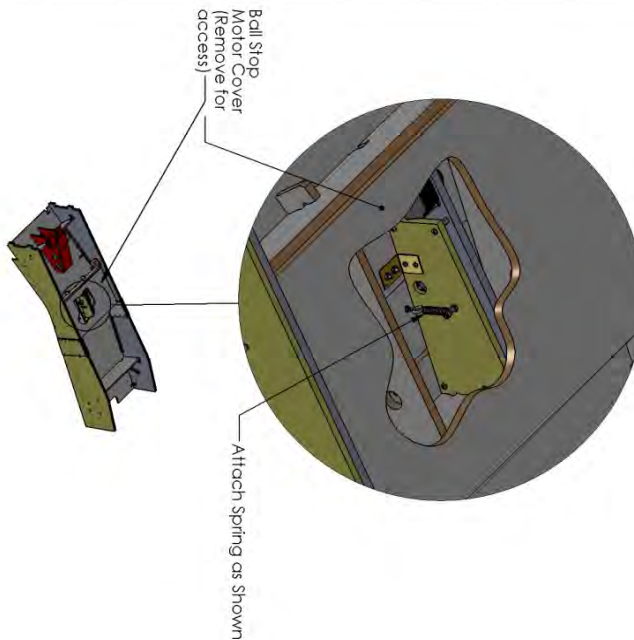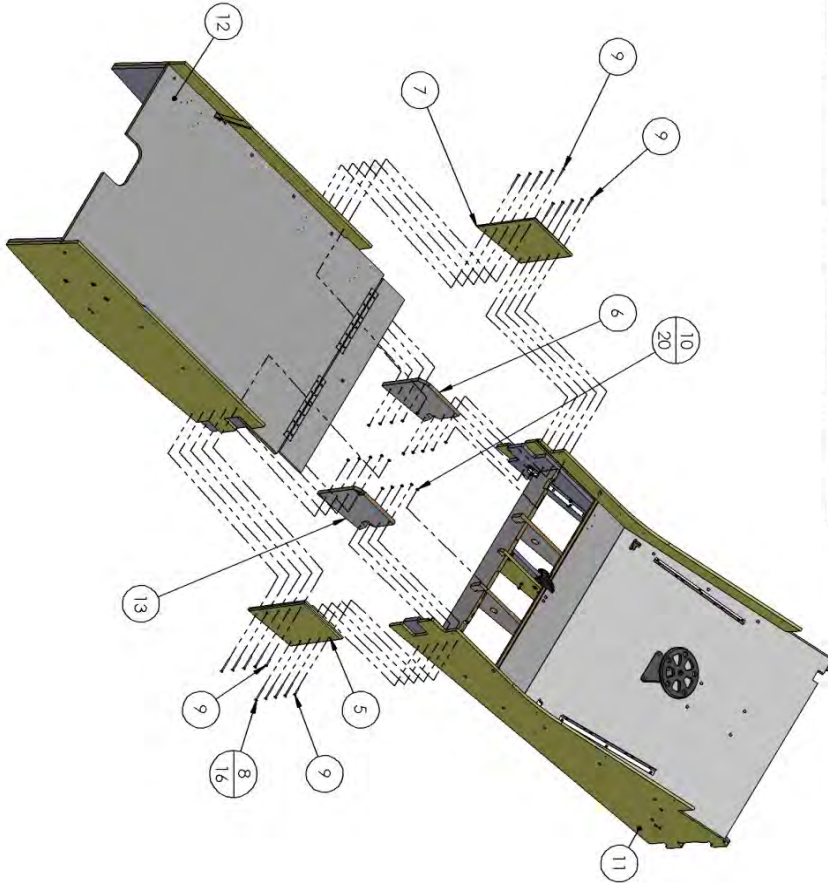
4. **Attach Platform between Backboard and Control Tower**
   - Lift *Platform Assembly* through the front of the *Backboard Assembly* and hook into slots in the back of the Backboard Assembly.
   - Slide *Control Tower* into Platform until the Platform Assembly drops over notch in back bottom of the Control Tower.
   - Attach *Platform Capture Plate*s to the back of the Backboard Assembly.
   - Attach platform harness to the main harness in the console.
   - Attach platform harness to the main harness in the backboard assembly.


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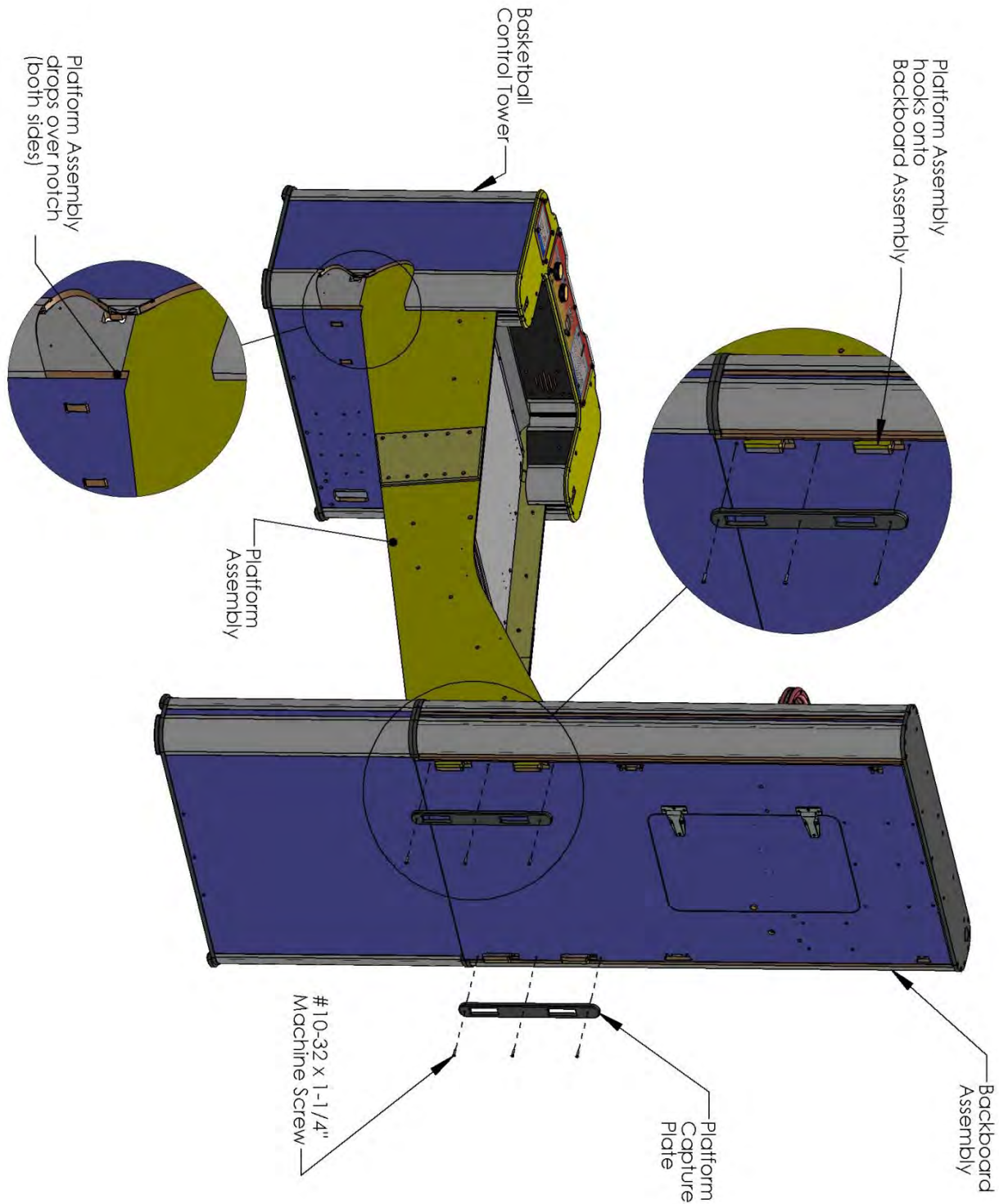
5. Attach Lower Side Nets

- Feed protruding aluminum rails of the *Left Lower Net Assembly* and *Right Lower Net Assembly* through the *Backboard Assembly*② until it aligns flush with the back of the Backboard Assembly.
- Insert two ¼-20 x ½" Hex bolts per side into the ends of the aluminum rails through the bolt slots in the back of the Backboard Assembly.
- Mount one *Rail Lock Plate* per side over hex bolts using acorn nuts.
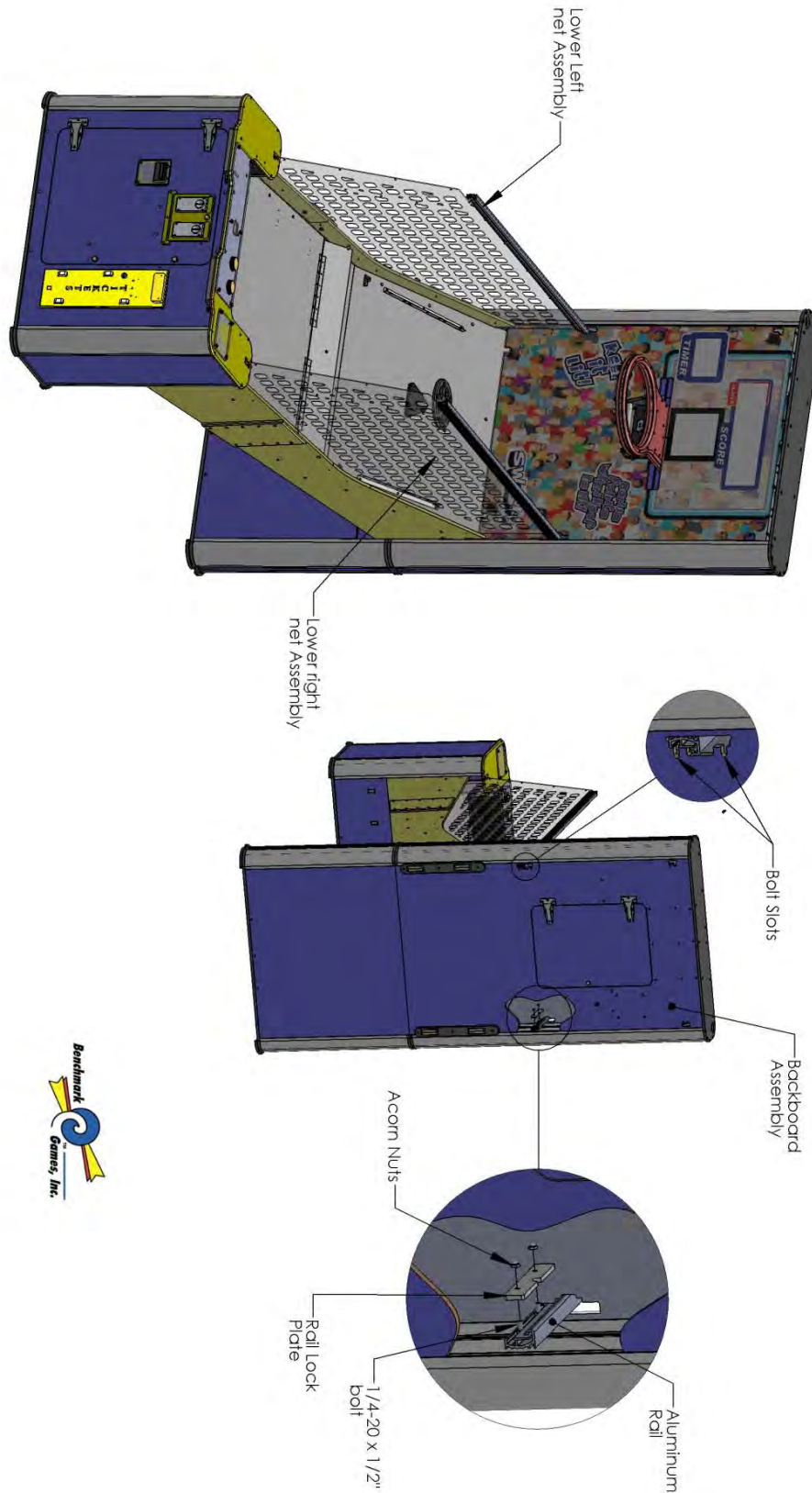
6. **Attach Upper Side Nets and Marquee**
   - Slide the _Marquee_ over the aluminum rails of the _Left Upper Net Assembly_ and _Right Upper Net Assembly_.
   - Install acorn nuts onto bolts in aluminum rails to secure rear upper ends of the side nets.
   - Feed aluminum rails through the _Backboard Assembly_ until they align flush with the back of the Backboard Assembly. _Be careful not to damage harness while installing_.
   - Insert two ¼"-20 x ½" hex bolts per rail into aluminum rails through the Bolt Slots in the back of the Backboard Assembly.
   - Mount one _Rail Lock Plate_ per aluminum rail to the aluminum rails over hex bolts using Acorn Nuts.
   - Connect harness for rail lights to main harness inside the backboard.
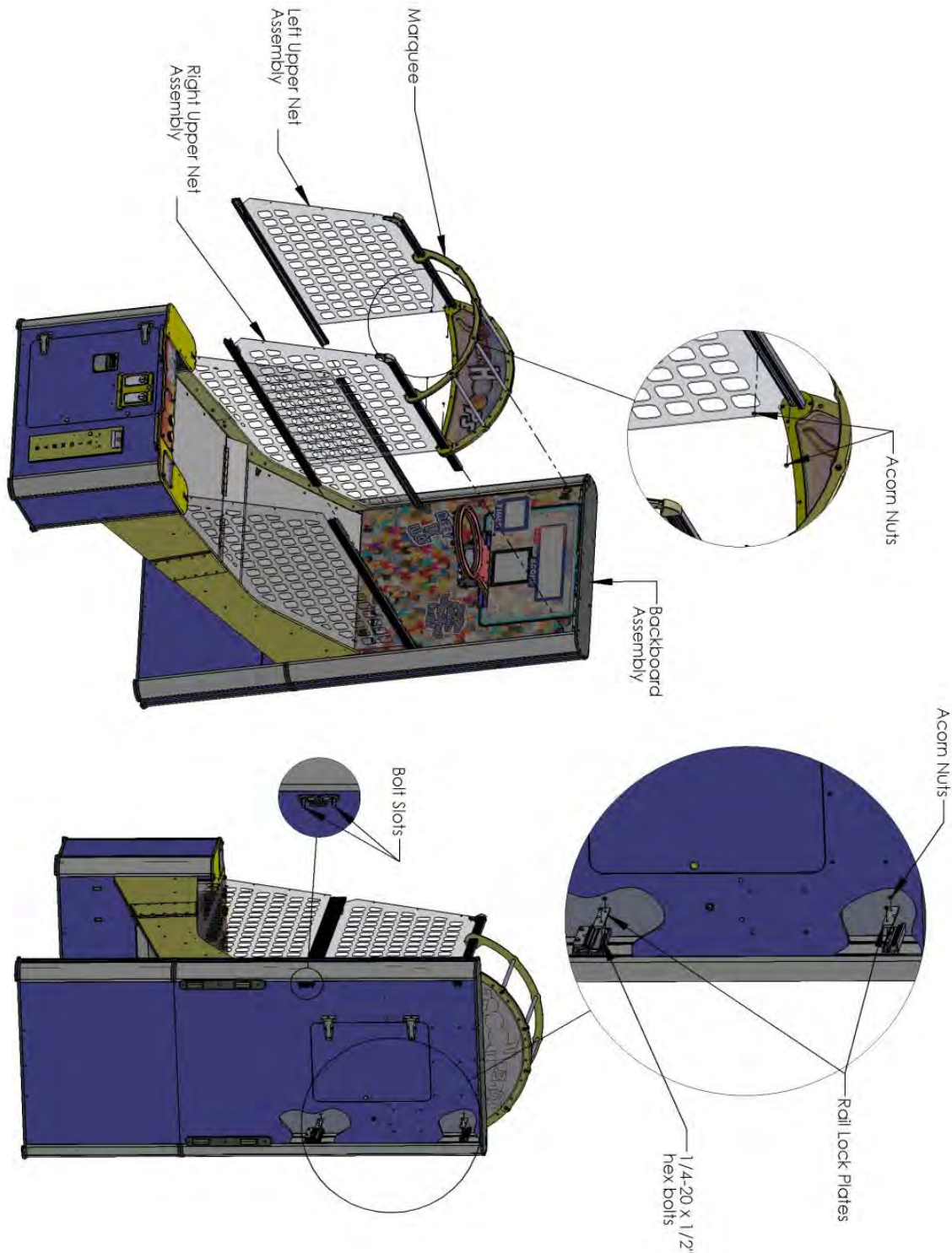
7. **Install Front Extruded Rails**
   - Slide *Left Front Extruded Rail* and *Right Front Extruded Rail* down into Receiving Slots in the top of the Control Tower Assembly.
     - You will need to flex the extruded rails of the Side Net Assemblies toward the inside of the machine to allow the rail bolts to clear the Side Net Assemblies as you slide it into place.
   - Attach Front Extruded Rails to Side Net Assemblies using Acorn Nuts.

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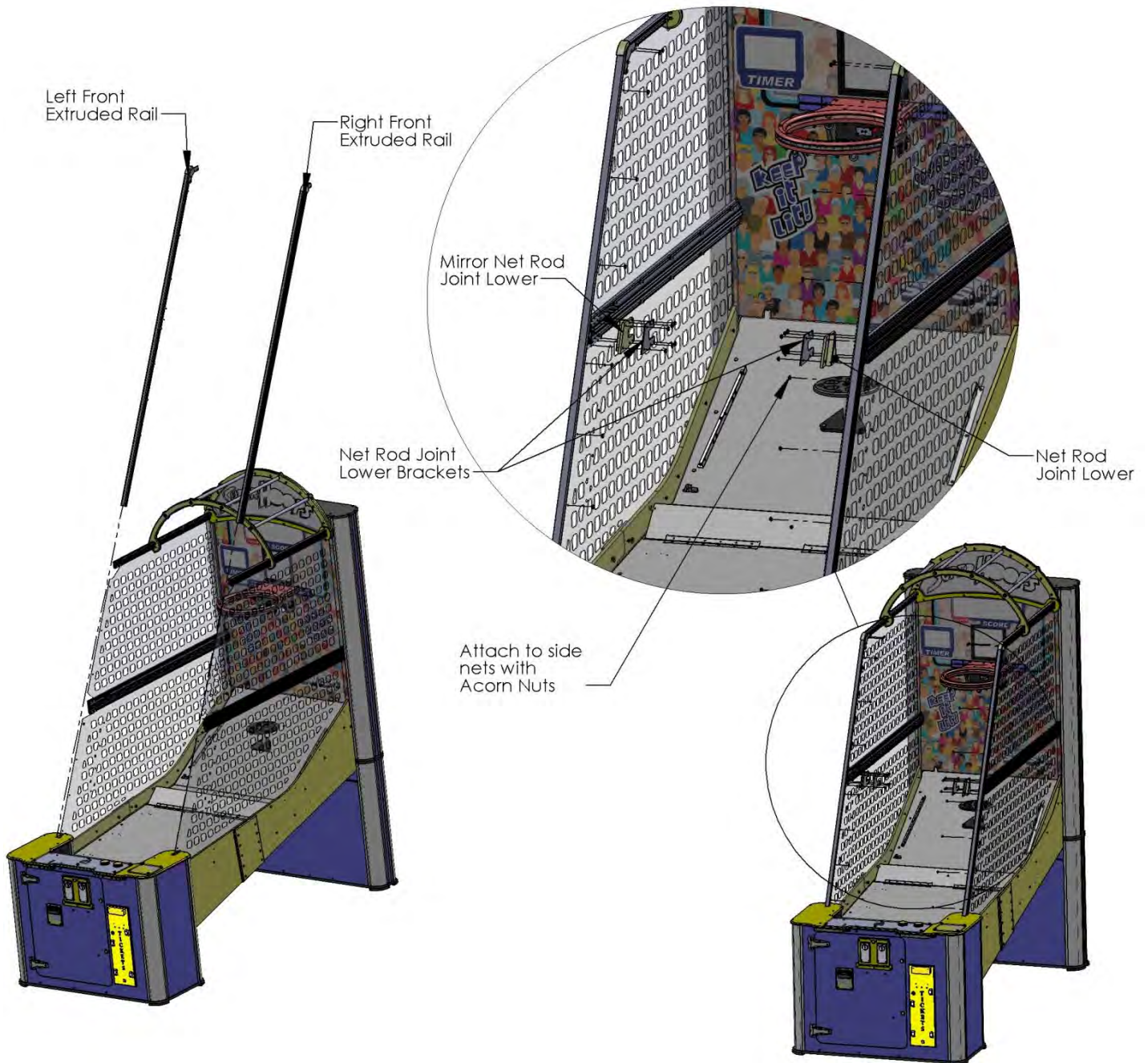
8. Install Platform Ball Guides and Ball Deflector Net Assembly
- Attach lower end of Lower Net Assemblies to the *Platform Assembly* with #10 x ½" sheet metal screws.
- Position Platform Ball Guides with the shorter end inserted into the slots in the Backboard
- Fasten using #10-32 x 1" Phillips, Pan, Machine Screws
- Slide protruding extruded aluminum rails of the *Ball Deflector Net Assembly* through Receiving Slots in top of *Platform Assembly*.
- Slide the Attach Posts into the slot in the Attach Bracket to secure top of Ball Deflector Net Assembly.

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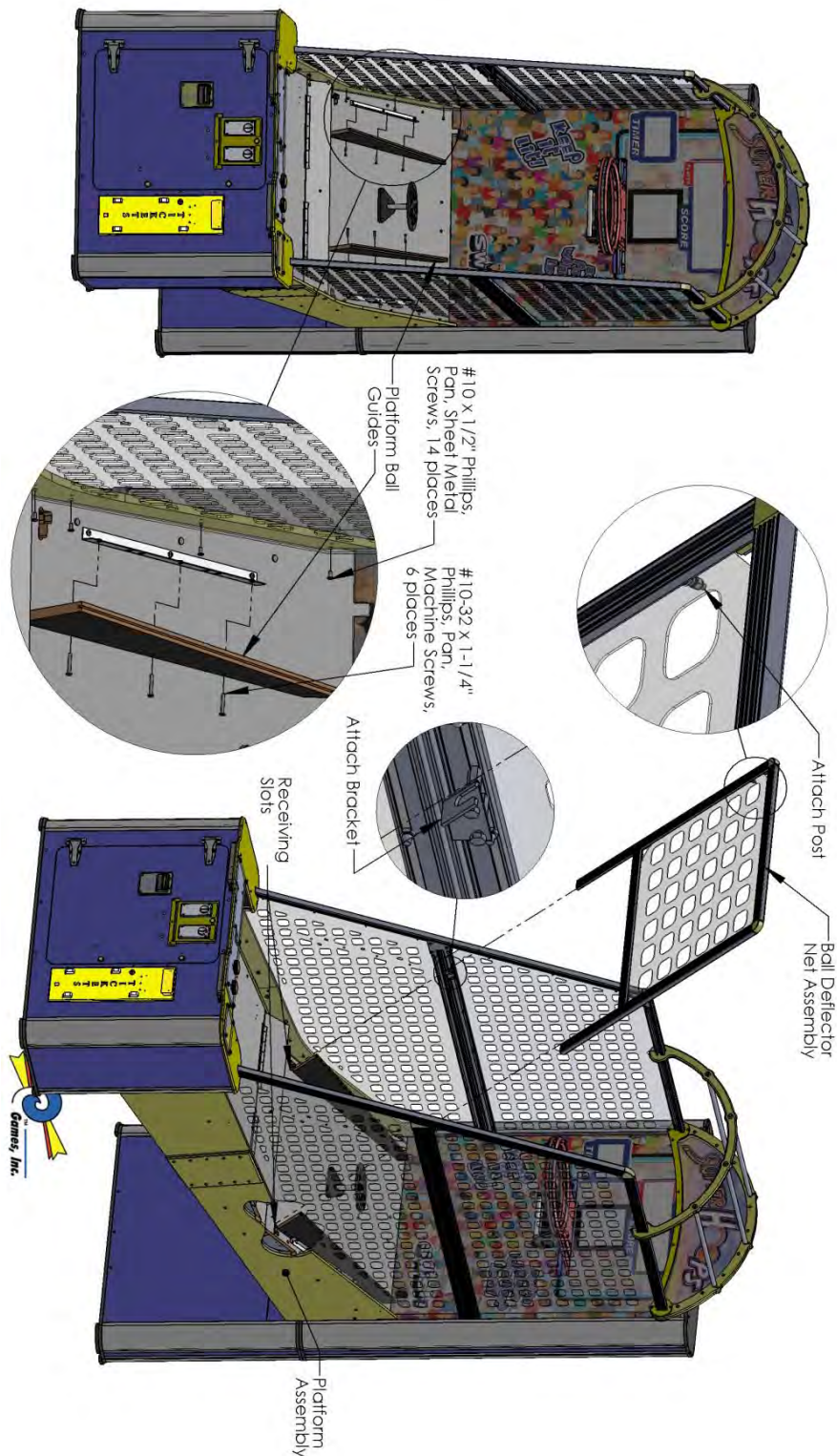
9. Install Kid Cage Assembly (Optional)

- Attach Kid Cage Assembly to side nets using carriage bolt, split lock washers, and acorn nuts as shown

Kid Cage Assembly

1/4" Acorn Nut,
8 places

1/4" Split Lock Washers,
8 places

1/4-20 x 1-1/4"
Carriage Bolts,
8 places
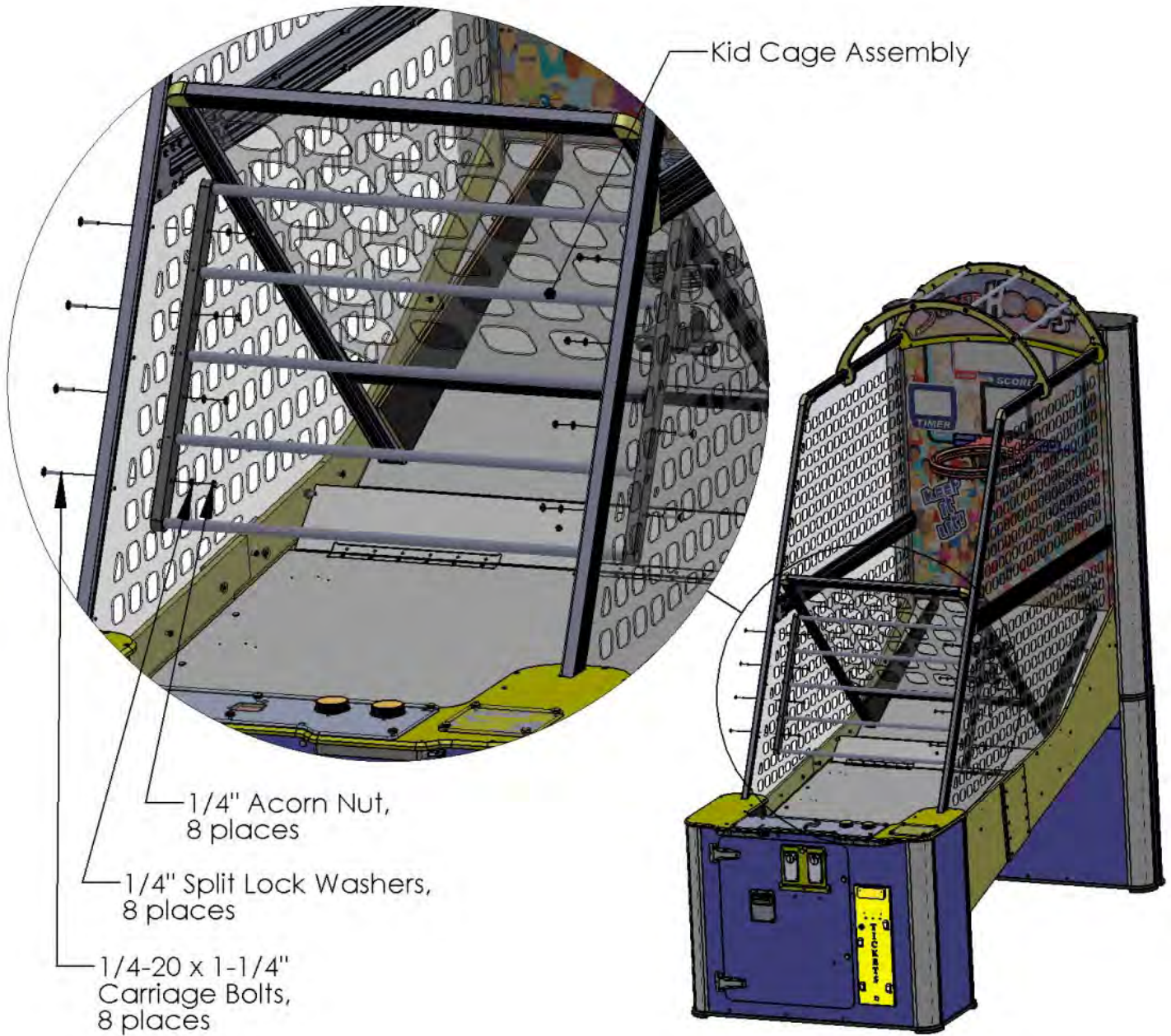
Power up

Plug-in the machine and turn it On from the Switch located on the lower-left side of the cabinet.

Note: There are two AC fuses on the within the power supply (10Amp, 250V each). They're found inside of the ICE-C13 receptacle on the power supply.

First-Time Setup

-If your Super Hoops was not ordered with a dollar bill acceptor, we recommend installing one to maximize revenue
  potential if it makes sense in your location
-Make sure that you run 6-7 balls in the machine. Because of the lit hoop feature, it is important that the player does not
need to wait for a ball in order to maximize revenue. Too many balls (8 or more) may cause balls to hang up.
-Ensure that all motors/sensors work by observing the sequence described on section 2-I.
  Any major anomaly, if present, should be seen at this point.
-Run through the 'Programming Mode' options and define your desired settings, like credits settings, sound
  Volumes, etc (See Section 5 for Benchmark's defaults).
-Confirm your settings to ensure they are what you wanted.

Recommended Payout Settings
Use default payout setting of 10 points per ticket. Fine tune after a couple weeks to dial in to desired percentage.

4- TECHNICAL OPERATION

Inter-Board Communication

The Circuit Boards communicate with each other using a 485 differential wire-pair network, using the SNAP software protocol layer.

- On this machine, this wire pair has colors Blue and Gray.

- The Main CPU Board acts as the master, initiating commands and receiving responses from the slave boards.
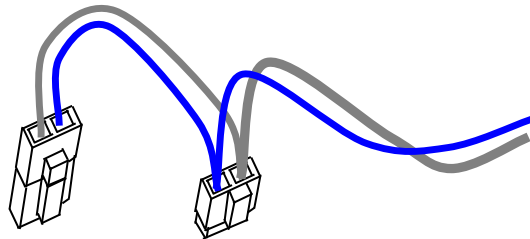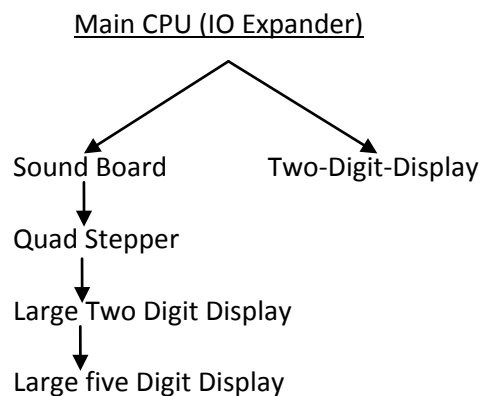
- Like-boards differentiate from each other by means of an ID-Switch setting. See the following pages to find each board's ID-Switch location and setting.

- The following board(s) is NOT connected to the 485 network:
> The Power distribution board.
> The Opto Sensors.

-Note that the 485 network wire-pair chain jumps from board to board:

> In some places the chaining is done by double-crimps at the connector
(these are usually 2-pin connectors)

>In other places, PCB traces on the board itself carry the chain from a pair of connector pins
to the next (usually a four-pin connector); thus, disconnecting such a board's 485 might actually
disconnect the rest of the 485 chain. Keep this in mind when troubleshooting or replacing parts.

-485 Communication network chain:

Main CPU (IO Expander)

Sound Board   Two-Digit-Display

Quad Stepper

Large Two Digit Display

Large five Digit Display

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Main Electronic Components

Power Distribution Board — Quad Stepper Board — Power Supply — Expander Board — Sound Board

Ball Sense Receivers — Ball Sense Transmitter

5 Digit Display — 2 Digit Display
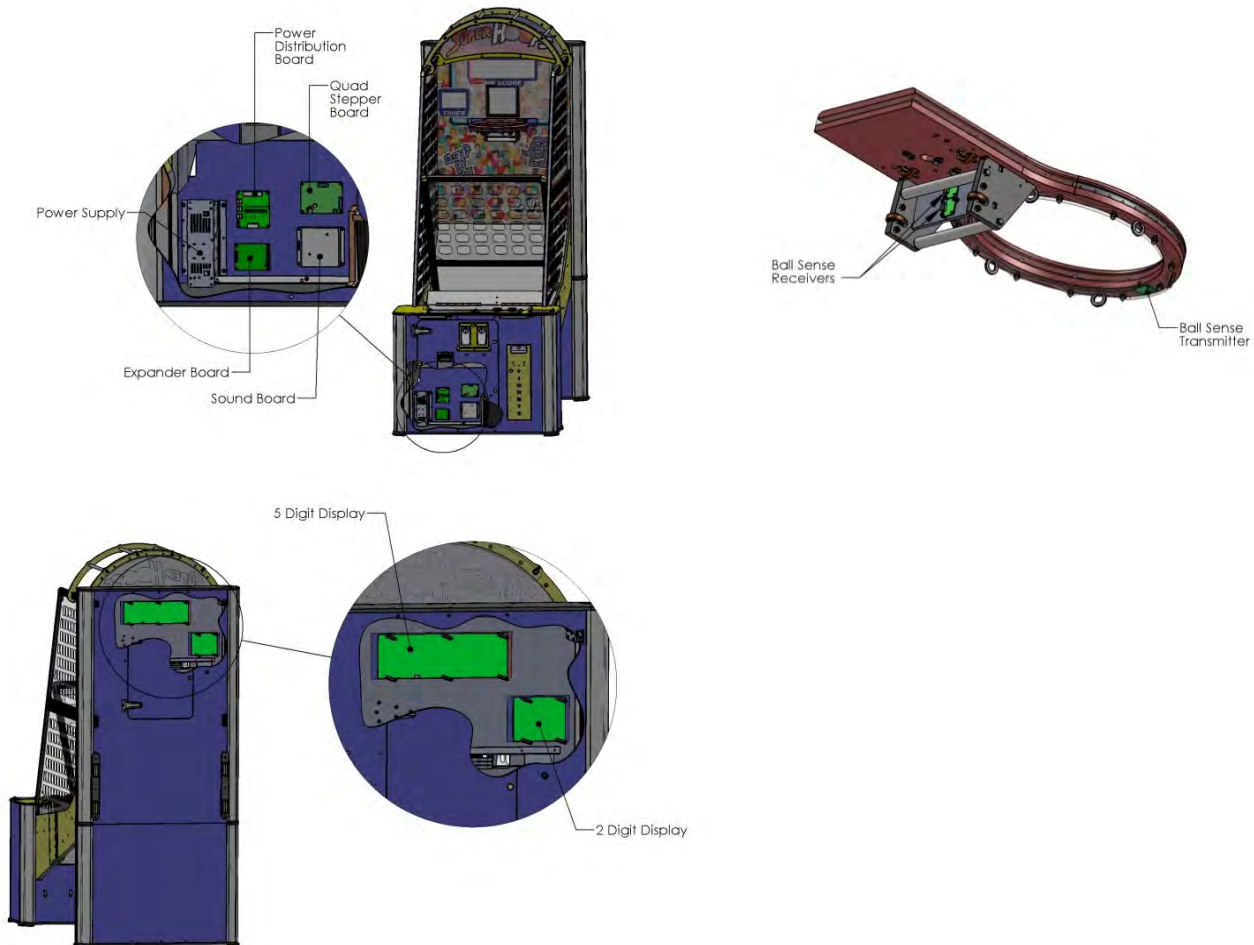
Power Distribution Board

Part# 120PCB005
Location: Control Tower.
ID-Switch setting: None, board has no computer.

Function: Distributes DC power from the power-supply to the different devices, through a Poly-Switch (thermal, resettable fuse) for each voltage circuit.
Not that for convenience, the 'Programming Options' Buttons are also located on this board, although they're not power related.

OUTPUTS
Switch 3
Switch 2
Switch 1
Circuit overload LEDs
Poly Switch Fuses (1A)
Input Voltage LEDs (must be On)
Switch Outputs

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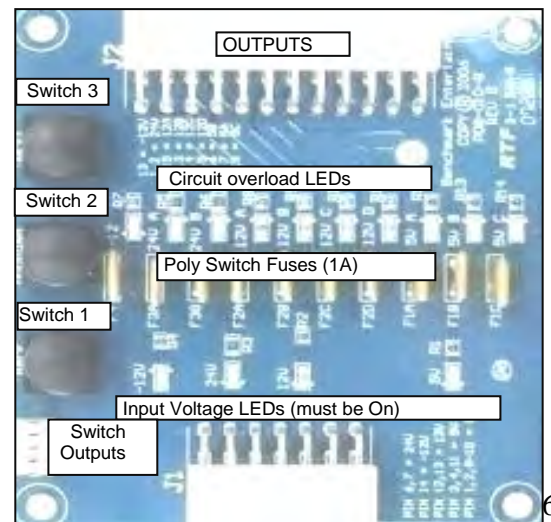
INPUTS

Power is distributed in the following manner (worst case estimations):

Board/Device	Estimated consumption	Fuse circuit (see board)
- Quad Stepper Board + 2 Motors	(24V, 2A)	(*24A*)
- Sound Board	(24V, 2A)	(*24B*)
- IO-Expander (Main CPU logic only)	(12V, 100mA)	(*12A*)
- Coin mech, buttons and disply	(12V, 500mA)	(*12B*)
- Optos	(12V, 100mA)	(*12C*)
- Ticket dispenser and bill validator	(12V, 1A	(*12D*)
- Hoop RGBs and pull ups	(5V, 1A)	(*5A*)
- Side RGBs	(5V, 4.2A)	(*5B*)
- Marquee RGBs	(5v, 2.3A	(*5C*)

Related Note: There are 2 AC fuses on the Power supply group (10Amp, 250 V). They're found inside of the ICE-C13 receptacle on the power supply.

Quad Stepper Controller

Part# PCB00068
Location: Control Tower.
ID-Switch setting: **00** (off-off)

Function: The stepper-motor controller board handles the low-level control of the game's motors.
Communication to the other boards is performed via a 485 differential wire-pair (Gray and blue wires).

J1: MOTOR DRIVER OUTPUTS

ID Switch

J2: LOGIC INPUTS

J3: Power, 12V

485 Communication

IO-Expander (Main CPU)

J3: OUTPUTS, Open Collector

J1: LOGIC INPUTS

ID-Switch

485 Communication

J2: Power, 12V
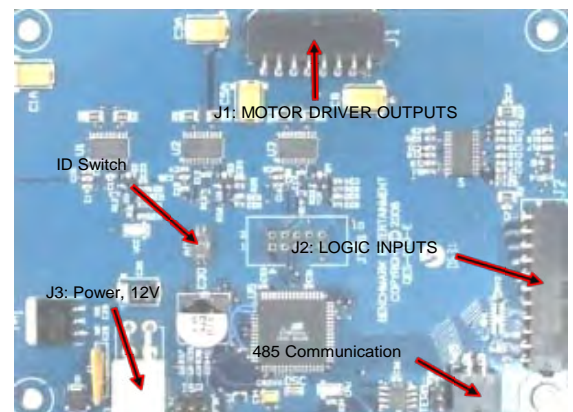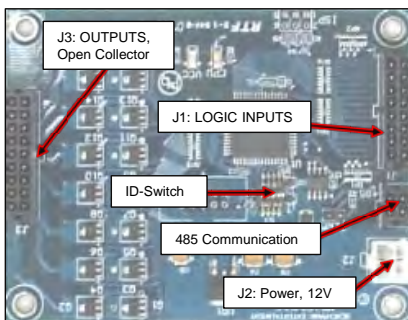
Part# 120PCB001
Location: Control Tower
ID-Switch setting: **0000** (off-off-off-off)

Function: This is the main CPU for the Supper Hoops it handles all

The game logic and the RGB LED lighting
Communication to the other boards is performed via a 485 differential
wire-pair (Gray and blue wires).
Note: The 'Programming Mode' game-settings information is saved in on-chip Flash

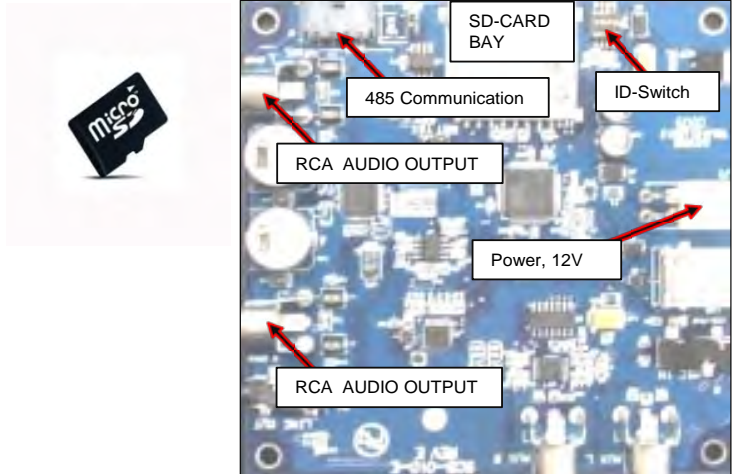## Sound Board W/ SD Card

Part# 120PCB002
Location: Control Tower
ID-Switch setting: **0000** (off-off-off-off)

Function: Handles background and event sounds.
Sound files are stored on the plug-in SD-card memory
board.

Micro SD card

Part# 120PCB003

Large 5-Digit Display

Part# PCB00014
Location: on back board above hoop
Qty: 1
ID-Switch settings:
Score and player display: **010000 (off-on-off-off-off-off)**
The ID-Switch is located on the back of the Display and
is labeled as "S1".

Large 2-Digit Display

Part# PCB00010
Location: Left side of back board above hoop
Qty:1
ID-Switch settings:
Timer Display: 1**00000 (on-off-off-off-off-off)**
The ID-Switch is located on the back of the Display and is labeled as
"S1".
 Note: Display is blue with reverse connector

Small 2-Digit Display
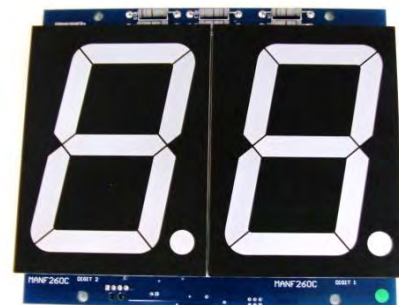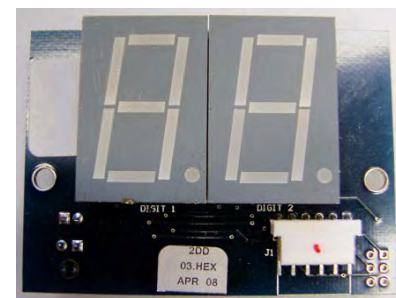
Part# PCB0004
Location: Front center console
Qty:1
ID-Switch settings:
Credits Display: 0**00000 (off-off-off-off-off-off)**
The ID-Switch is located on the back of the Display and is labeled
as "S1".

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Hoop Opto Transmitter
Part # 120PCB004
Location: Hoop Assembly

Function: Transmitter for sensing basketballs.

Hoop Opto Receiver
Part # PCB00025
Qty:2
Location: Hoop Assembly
Function: Opto Receiver for sensing basketballs.

Bill Acceptor (Optional)
MARS Mei 2451 or 2681 (115VAC Models)
Part # ELM00081
Location: Cash Drawer
Default Benchmark Games Operational Settings:
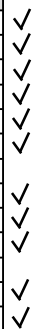This is done by setting the side configuration Dip-Switches as follows:

MARS AE2451

On	OFF	Setting Obtained:
1		4-way accept
2		4-way accept
3		High Security
4		$1
5		no $2s
6		$5
7		1-Pulse-per-Dollar
8		Harness Enable

MARS AE2681

OFF	On	Setting Obtained:
8		Vending Interface
7		1-Pulse-per Dollar
6		Harness Enable
5		$20
4		no $2s
3		High Security
2		4-way accept
1		4-way accept

Enable/Disable feature (Game controlled):
[Note that we provide the appropriate
adaptor harness/connector for this bill acceptor]

Pin Name (all pins refer to P1)	Type	115 VAC pin	
115VAC HOT / 24VAC HOT	Power	20	✓
115VAC NEUTRAL / 24VAC NEUTRAL	Power	4	✓
Earth	Power	21	✓
Denom 1 ENABLE, High	Input	15	✓ (+5V)
Denom 2 ENABLE, High	Input	14	✓ (+5V)
Denom 3 ENABLE, High	Input	13	✓
ESCROW, High	Input	12	
Denom 1 ENABLE, Low	Input	27	✓
Denom 2 ENABLE, Low	Input	28	✓
Denom 3 ENABLE, Low	Input	29	✓
ESCROW, Low	Input	30	
CREDIT-PULSE_NOT	Output	7	✓
LOW LEVEL GROUND	Ground	10	✓
OUT-OF-SERVICE POWER (200 ohms to +5 VDC)	Output	25	
OUT-OF-SERVICE_NOT	Output	22	

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5- PROGRAMMING OPTIONS

Programming Super Hoops

To enter Programming Mode, depress the center button on the Power Distribution Board, located on the front left side of the lower cabinet. An audio prompt indicating "ENTERING PROGRAMMING MODE" will be sounded. Upon releasing the button, the number of the first programming option will be displayed on the timer display, and the value of the option will be displayed on the Score Display. From this point forward, depressing the center button will advance to the next programming option (which will be indicated by an Audio prompt and the Programming Option Number displayed on the Timer Display), the button closest to the front of the cabinet will increase the value of the displayed option, and the button farthest from the front of the cabinet will decrease the value of the displayed option. Advancing past the last programming option will leave programming mode, and an audio prompt stating "THANK-YOU, RE-INITIALIZING" will be heard.

OPTION #	OPTION DESCRIPTION	VALUE RANGE	DEFAULT
1	PRICE	0(FREE PLAY) – 8	1 Coin
2	POINTS PER TICKET	0 – 100	10
3	POINTS TO ACHIEVE STAGE 2	20-800	50
4	POINTS TO ACHIEVE STAGE 3	(STAGE2 PTS + 5) – 800	120
5	POINTS TO ACHIEVE STAGE 4	(STAGE3 PTS + 5) – 800	220
6	PLAY MODE VOLUME	0(OFF) – 255	81
7	ATTRACTION MODE VOLUME	0(OFF) – 255	81
8	STAGE 1 TIME	20 – 80 Seconds	35
9	STAGE 2 TIME	20 – 80 Seconds	30
10	STAGE 3 TIME	20 – 80 Seconds	25
11	STAGE 4 TIME	20 – 80 Seconds	20
12	ATTRACTION MODE FREQ.	0(OFF) – 30 minutes	30 min.
13	MERCY TICKET	0 – 5	0 (off)

6- ALTERNATE COIN/BILL AND CARD-SWIPE SYSTEM CONFIGURATIONS

There are a few alternative configurations regarding Card Swipe systems and Bill Acceptor devices that are possible to setup, depending on your location. These are described in a general fashion as follows.

Note that the system expects the following timing ranges for any pulses:
  Low time: 40-80mS
  Up time: 100-150ms

CARD SWIPE SYSTEM

The Coin-Mech and/or Bill Acceptor can be replaced to set up a swipe-for-credits scheme.
The recommended set up is as follows:

-Remove the Coin-Mech and/or Bill Acceptor and install your card swipe systems in one of the two spots.
  [contact customer service for custom plastic plates for this purpose].

-Have your card swipe system tap into the Coin or Bill signal line.

-Configure your card swipe system for a 1-pulse-per-swipe response.

-If tapping the coin signal line (Gray–Red wire), 1 pulse (swipe) will count as 1 coin internally.

-If tapping the bill signal line (Gray-Green wire), 1 pulse (swipe) will count as 4 coins internally.

-Configure the game to provide the necessary credits for the 'coin' count indicated above and the actual money
  you will charge per-swipe.

-If possible (strongly recommended), hook up your system to the enable line (Blue-Green wire), so that the
  game can stop money intake in case of any error or fault.

-Additionally, if your scheme supports/requires accounting, you can tap from the pulse signal (White-Blue wire)
  going to Hard-meter box #2 (see page 16), which tracks the number of toys vended.

COIN MECHS
It is possible to use other coin mechanisms on this machine. The wiring harness terminates on both Spade-type connectors and an IDC connector for this purpose, the signal lines are:

#	Wire Color	Signal
1	Yellow	12V

2	Gray-Red	Coin Signal
3	Blue-Green	Enable (low=enable, high=disable) (this should be hooked to coin-mech ground)
4	Black	GND, actual DC Ground

Notes:

The 'Device Ground/Enable line comes from the IO-Expander 3 Board, as commanded by the main CPU to enable or disable money intake. It is necessary that your coin-mech device has a coin-lock 'reject' solenoid so that this feature is available.

Normally, for an Imonex, if it has a coin reject solenoid, you hook the solenoid's 'ground' to the enable line, so that the game can control it.

For an electronic coin-mech, like the MPU, you hook up the coin-mech's 'ground' to the enable line.

BILL ACCEPTORS

It is possible to use other bill acceptors on this machine,
like the IT-Bellis BV50, or the Pyramid Apex 5000 Series.

The wiring harness on the Cash Drawer terminates on a 12-Pin Molex female   connector, providing all the necessary signal lines:

Pin	Wire color	Signal
1	Red	5V
2	Yellow	12V
3	Black	GND, actual DC Ground
4	Gray-Green	Bill Pulse Signal
5	Blue-Green	Enable (low=enable, high=disable) (same 'Enable' line as for coin-mech above)
6	White	AC Neutral
7	Black	AC Hot
8-12	- -	Reserved

This connector is followed by an adaptor harness for the appropriate device. We stock adaptor harnesses for the Mars 2451, the IT-Bellis BV50 and the Pyramid bill acceptors. [Please note that we strongly recommend a device that supports a Logic-Enable line, so that the game can stop money intake in case of any error or fault].
Please contact customer service if necessary.

7- MECHANICAL

Hoop Drive Detail
The hoop on the Super Hoops games rides left to right on rollers and is belt driven by a stepper motor. The belt is continuous, and clamps to the hoop assembly. There is an idler pulley opposite the motor mounted to the hoop motor bracket.

Hoop Motor Bracket

Hoop Motor

Belt Clamp

Timing Belt

Idler Pulley
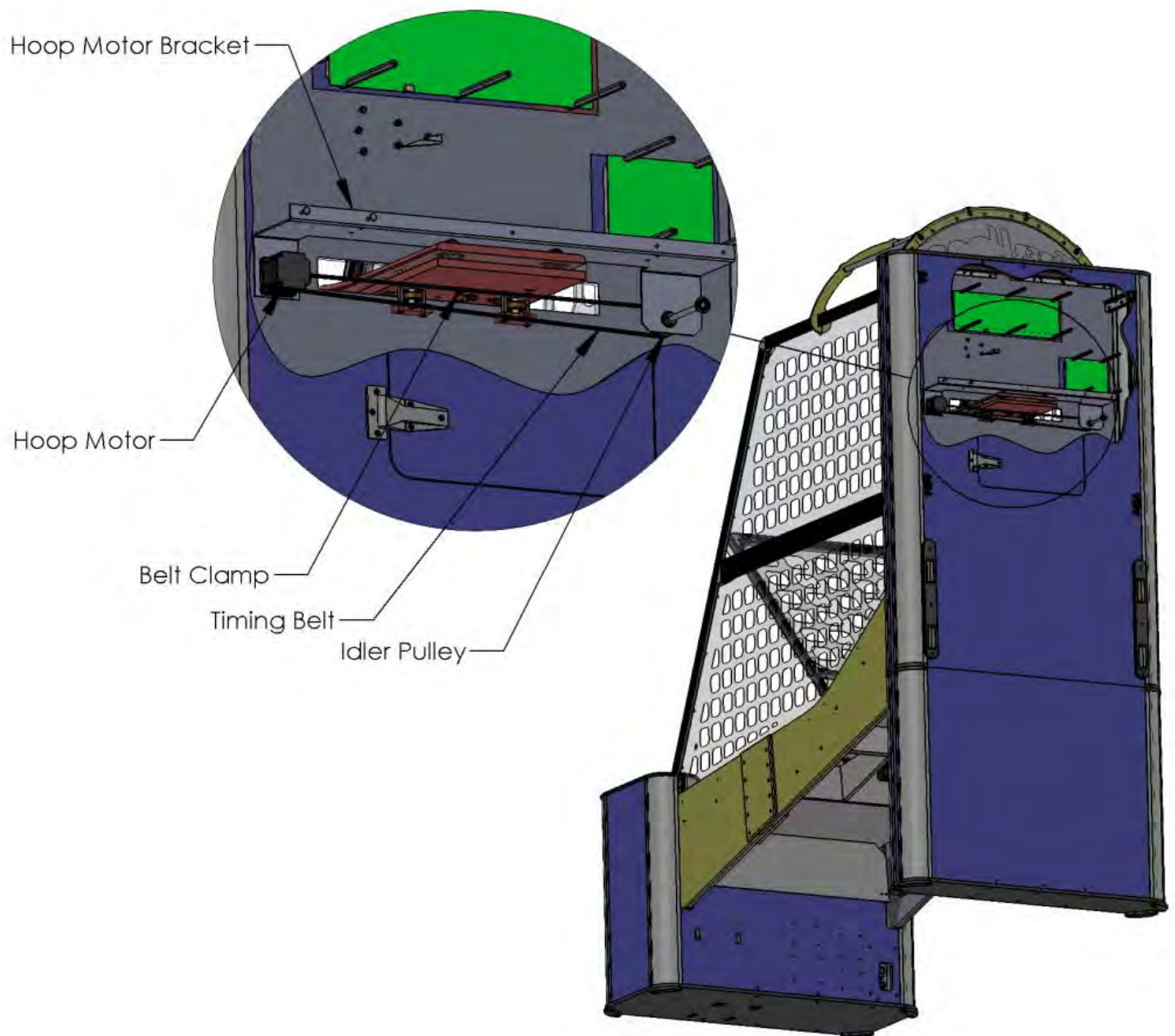
Ball Stop and Bellows Detail

- The ball stop on the Super Hoops game is operated with a stepper motor that drives a cam that lifts the ball stop door. The Ball Stop Cam Assembly mounts with a single mounting bracket and is accessible by removing the Ball Stop Motor attached with 6 screws. The motor rotates the cam to position the ball stop up or down appropriately.
- The Bellows assembly is located underneath the ball ramp. When a ball hits the impact plate located directly underneath the hoop, a bellows is compressed within the bellows assembly which creates an air blast to blow off the opto sensors.

Ball Stop Cam Assembly

Ball Stop Motor Cover

Bellows Assembly

Air Hose Connection

Ball Stop Cam Assembly

Motor

Cam

Mount Bracket

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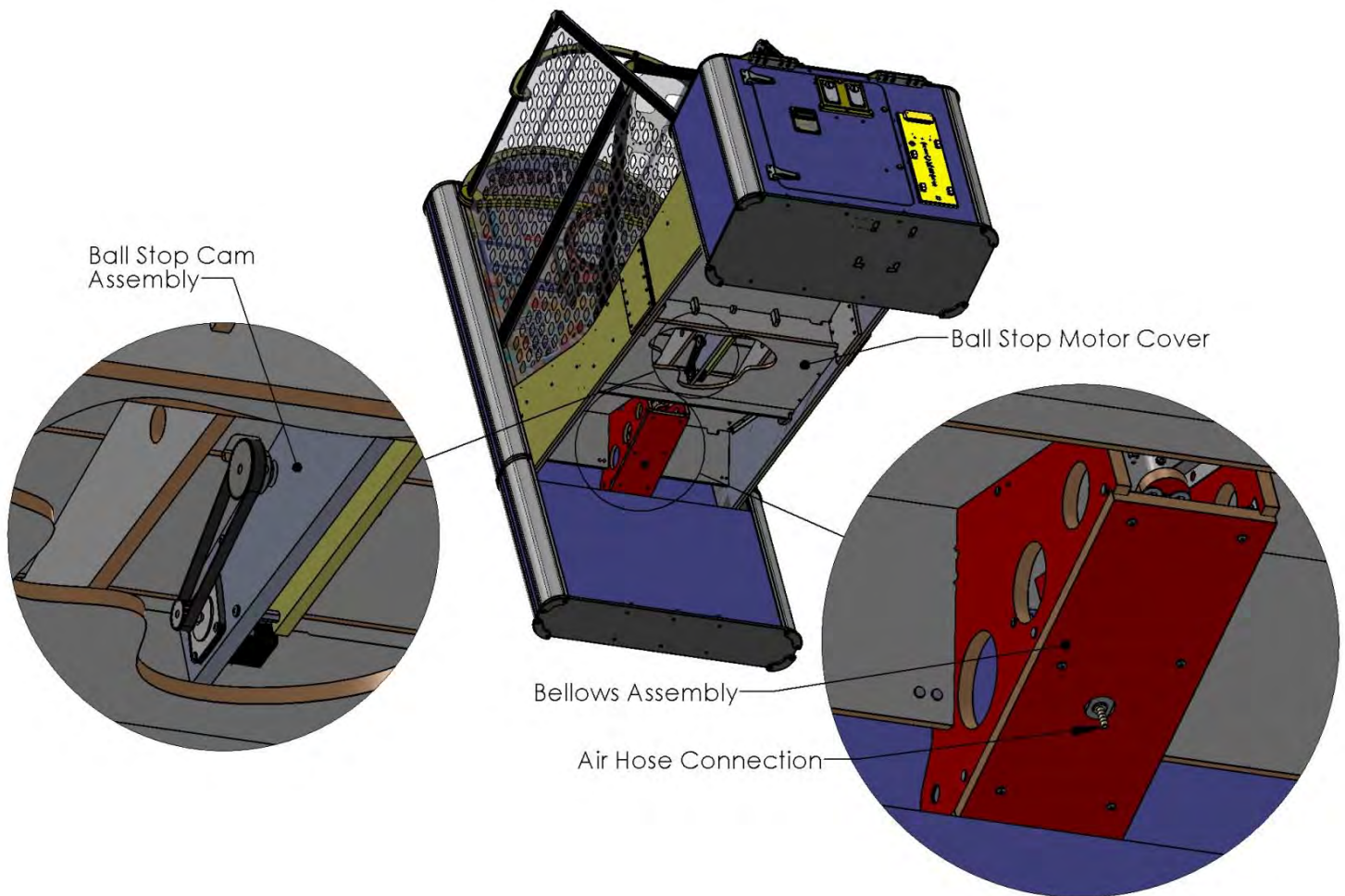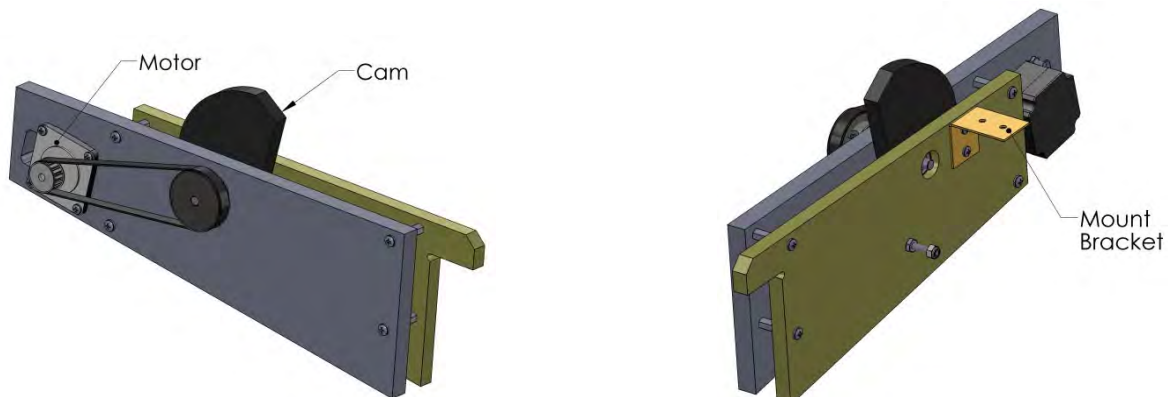
8- ERROR CODES AND TROUBLESHOOTING GUIDE

E-1 = Quad Stepper Board Communications Error
E-2 = Sound Board Communications Error
E-3 = Ticket Error
E-4 = Jackpot Display Communications Error
E-5 = Timer Display Communications Error
E-6 = Credit Display Communications Error

Please Note: Error codes will not display in the middle of a game. Once the game is over, then the errors will display.

Symptom	Corrective Action
E-1 error code	E-1 signifies a communication error with the Quad Stepper Circuit Board. • Check communication wiring and connections (2 pin blue wire and grey wire). • If wiring is OK, Quad Stepper Circuit Board may need replacement.
E-2 error code	E-2 signifies a communication error with the Sound Board • Check communication wiring and connections (2 pin blue wire and grey wire). • If wiring is OK, Stepper Board may need replacement.
E-3 error code	E-3 signifies Ticket Error. • Refill ticket dispenser drawer with tickets if empty • Clear ticket jam at ticket dispenser
E-4 error code	E-4 signifies communication error with the Jackpot Display Circuit Board • Check communication wiring and connections (pin 1 blue and pin 2 grey) • If wiring is OK, Jackpot Display Circuit Board may need replacement
E-5 error code	E-5 signifies communication error with Timer Display Circuit Board. • Check communication wiring and connections (2 pin blue wire and grey wire). • If wiring is OK, Timer Display Circuit Board may need replacement.
E-6 error code	E-6 signifies communication error with Credit Display Circuit Board • Check communication wiring and connections (2 pin blue wire and grey wire). • If wiring is OK, Credit Display Circuit Board may need replacement.
Hoop Does not move or hesitates during levels 3 or 4	It is normal for the hoop to hesitate occasionally during play in levels 3 and 4 when it is active due to excessive force from ball impact or ball binding. When this happens the machine self corrects and returns to normal play. If the hoop hesitates often or almost continuously: • Check the wiring to the motor. If one wire is not connected or intermittent, the motor will appear to try to move, but will not have enough power. • Open the rear access door and look for any binding and that rollers are round and move freely
Game does not register balls going through hoop	If the game does not recognize balls that pass through the hoop every time: • Check that the opto transmitter (located on the front inside of the hoop) and the two receivers (mounted to the plate underneath the back of the hoop) are clean. Use compressed air to blast the sensors clean. • Check that the optos are not loose or obviously misaligned. • Replace bad transmitter or receivers if necessary.

Mechanical Drawings

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	120SHM001	backboard roller bracket	1
2	120ASM054	Stepper_MOT009 W_connector	1
3	GER023	Timing Belt Pulley, 15XL037, 1/4" bore, set screw mount	1
4	HAR11100	8-32 x .750 PPMS	4
5	HAR11032	10-32 x .375 PPMS	4
6	HAR11034	10-32 x .750 PPMS	4
7	HAR11061	4-40 x .375 PPMS	4
8	HAR20011	#8 flat washer	4
9	HAR35009	#6-32 Kep Nut	4
10	BRG008	bearing ball 313IDx866OD flanged	1
11	120MAC064	hoop bounce plate	1
12	SPA20035	#10-32x.375hexx2.000	4
13	SPA20028	#4-40x.188hexx2.175L	2
14	HAR90027	wire track end female	1

Loc.	Rev.	Description	Date
	2	Change Motor	01/23/12
	A	Release to Production	06/13/12
	B	Change 2" spacers to 2.175 & change 5/16" hex spacers to 3/8" to keep hardware standard	07/09/13
	C	Update motor part number	08/09/13

Benchmark Games, Inc.

TITLE: backboard roller bracket assembly

SIZE: B DWG. NO. 120ASM003 SCALE: 1:4 WEIGHT: SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	120MAC122	ball stop cam mount plate	1
2	120MAC123	ball stop motor mount plate	1
3	MOT015	stepper PK266-01A	1
4	BRG008	bearing ball 313IDx866OD flanged	2
5	GER-18	pulley 15XL037	1
6	30XL037-FS30-.813H1.35L0.3125N		1
7	#10-32x.516hexx.750L	Hex Spacer_FF	4
8	BLT009	timing belt, 166XL, 3/8" wide	1
9	87SHM28	center post mount bracket top	1
10	HAR11093	8-32 x .500 PPMS	2
11	HAR11034	10-32 x .875 PPMS	8
12	HAR11128	8-32 x 1.250 PPMS	4
13	HAR35009	#6-32 Kep Nut	6
14	120ASM043	gate lift cam assy	1
15	HAR90005	shaft collar 688ID 2 piece	1
16	HAR36004	#10 Fiberlock Nut	1
17	carriage bolt #10x1.500	carriage bolt	1
18	#10 Kep Nut	#10 Kep Nut	1

Loc.	Rev.	Description	Date
	A	Release to Production	03/15/13
	B	Change (2) screw lengths	04/16/13
	C	Add detail view showing nut location	04/30/13

Thread nut until flush with end of bolt

Benchmark Games, Inc.

TITLE: ball stop cam assy

SIZE: B DWG. NO. 120ASM045 SCALE: 1:3 WEIGHT: SHEET 1 OF 1

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Sheet 1 of 2 — Parts List

ITEM NO.	PART NUMBER	DESCRIPTION	Default /QTY.
1	120MAC040	control tower door	1
2	120MAC061	coin chute side plate	1
3	120MAC062	mirrorcoin chute plate	1
4	120MAC063	coin chute side plate2	1
5	HAR00089	Barrel Lock Nut	2
6	HAR11016	10-32 X 1.000 PPMS	10
7	160MAC060	coin chute plate	1
8	103MAC046	DBV cover plate	1
9	HAR11074	6-32 x .500 PPMS	3
10	120MAC016	coin mech security cover	1
11	HAR002	lock_only	2
12	HAR005	lock cam offset	2
13	SPA10041	#10x375ODx563L	3
14	HAR40012	carriage bolt #10x2.500	3
15	HAR35004	#10-32 Kep Nut	3
16	HAR40025	carriage bolt #6x1.500	2
17	SPA0079	#6-32x.250hexx3.500L	3
18	SPA20006	#6-32x.250hexx.500L	2
19	HAR35009	#6-32 Kep Nut	1
20	SPA20049	#10-32x2.5x313hex	5
21	HAR00092	250-20 x .25 PPMS	2

Revision Block (Sheet 1)

Loc.	Rev.	Description	Date
	1	Prototype Release	08/10/11
	2	Major Revision	11/23/11
	A	Release to Production	07/05/12
	B	Change Hardware to Standardize	07/25/13

Benchmark Games, Inc.
TITLE: control tower door assy
SIZE B DWG. NO. 120ASM009
SCALE: 1:4 WEIGHT: SHEET 1 OF 2

Sheet 2 of 2 — Parts List

ITEM NO.	PART NUMBER	DESCRIPTION	explode 2/QTY.
1	120MAC040	control tower door	1
2	160MAC060	coin chute plate	1
3	120MAC061	coin chute side plate	1
4	120MAC062	mirrorcoin chute plate	1
5	120MAC063	coin chute side plate2	1
6	HAR00089	Barrel Lock Nut	2
7	HAR40049	carriage bolt #8x1.250	4
8	HAR11016	10-32 x 1.000 PPMS	10
9	ELM033	bill acceptor mars1	1
10	coin door assy dual	ASM005	1
11	103MAC046	DBV cover plate	1
12	HAR11074	6-32 x .500 PPMS	3
13	120MAC016	coin mech security cover	1
14	HAR002	lock_only	2
15	HAR005	lock cam offset	2
16	HAR35009	#6-32 Kep Nut	5
17	SPA10041	#10x375ODx563L	3
18	HAR40012	carriage bolt #10x2.500	3
19	HAR35004	#10-32 Kep Nut	3
20	120MAC010	Bill Validator Cover_Mars	1
21	HAR35009	#8-32 Kep Nut	2
22	HAR40025	carriage bolt #6x1.500	5
23	SPA0079	#6-32x.250hexx3.500L	3
24	SPA20006	#6-32x.250hexx.500L	2
25	SPA20049	#10-32x2.5x313hex	5
26	HAR00092	250-20 x .25 PPMS	2

Revision Block (Sheet 2)

Loc.	Rev.	Description	Date
	2		11/23/11
	A		07/05/12
	B	Change Hardware to Standardize	07/25/13

Benchmark Games, Inc.
TITLE: control tower door assy
SIZE B DWG. NO. 120ASM009
SCALE: 1:4 WEIGHT: SHEET 2 OF 2

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ITEM NO.	PART NUMBER	DESCRIPTION	Defau lt/QTY
1	082ASM028	bearing roller assembly 375x875 flanged	4
2	HAR90028	wire track end male	1
3	#4 Kep Nut	#4 Kep Nut	2
4	120ASM024	opto mount assembly	1
5	120MAC001	hoop_plate	1
6	120MAC003	hoop_plate top	1
7	120SHM002	belt clamp	1
8	120MAC118	hoop led cover	1
9	120ASM025	hoop center plate assy	1
10	HAE13027	8-18 x .500 PPSM_(AB)	2
11	HAR11126	8-32 x 1.75 PPMS	3
12	HAR11078	6-32 x 1.75 PPMS	2
13	120MAC106	120MAC106	120
14	120SHM008	Net Mount Clip Metal	6
15	HAR13002	10-18 x .500 PPSM_(AB)	1
16	120ASM038	opto cover assy	1
17	GEN72008	cable clamp_250	5
18	HAR35009	#6-32 Kep Nut	5
19	GEN72007	1/2" cable clamp	1
20	GEN40006	grommet 375IDx875ODx063 panel	6
21	HAR20011	#8 flat washer	12
22	HAR31001	acorn nut #8-32	12
23	HAE12081	Default	12
24	HAR13005	10-16 x 1.75 PP Type B	4
25	HAR11057	4-40 x 1.375 PPMS	2

Loc.	Rev.	Description	Date
	1	Prototype Release	08/24/11
	2	Major Revision	11/18/11
	A	Add (1) #10 x 1/5" PPSM and 3/8" clamp	01/31/12
	B	Add (6) grommets & change hardware	07/18/13

Benchmark Games, Inc.

TITLE: hoop assy

SIZE B   DWG. NO. 120ASM004

SCALE: 1:5   WEIGHT: SHEET 1 OF 1

DRAWN S. Corso 8/24/2011

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	120MAC112	bellows arm	1
2	120SCM010	bellows arm pivot rod	1
3	HAR11022	10-32 x 1.500 PPMS	4
4	HAR11016	10-32 x 1.000 PPMS	9
5	HAR11092	#8-32 x 1.000 PPMS	4
6	SPA20038	#10-32x.375hexx.625L	2
7	120MAC113	bellows support plate	1
8	120MAC114	bellows support plate side	2
9	GEN2017	bellows 4.5	1
10	077SHM081	center post mount side	2
11	87SHM28	center post mount bracket long	2
12	HAR20008	#8x75ODD flat washer	1
13	HAR36004	#10 Fiberlock Nut	2
14	SPR10017 (9657K124)	spring_compression 3000Lx88ODx047wire	1
15	125SCM016	impact pate attach spacer	1
16	HAR35009	#6-32 Kep Nut	4
17	HAR20002	#10 flat washer	4
18	HAR35002	#10-24 Kep Nut	6
19	HAR37002	tee nut propeller 10-32	2
20	HAR40006	carriage bolt	6

Loc.	Rev.	Description	Date
	B	Add (3) washers and Loc-Tite note	12/05/12
	C	Add (2) #10 carriage bolts, (2) #10 washers, & (2) #10 lock nuts	12/31/12
	D	Change spring	01/03/12
	E	Add hardware part #'s	07/02/13

Note:
Use permanent Loc-Tite when attaching (3) 0.375" hex spacers.

Benchmark Games, Inc.

TITLE: bellows arm assembly

SIZE B   DWG. NO. 120ASM040

SCALE: 1:5   WEIGHT: SHEET 1 OF 1

DRAWN S. Corso - 7/31/2012

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	120ASM020	marquee assy basketball	1
2	120MAC072	top net end bracket front	1
3	77SCM008	shoulder washer tree spacer	8
4	120mac057	top net tube	4
5	120MAC058	marquee plate	1
6	120ART002	artwork basketball marquee	1
7	120SCM008	marquee attach rod	4
8	Flat Washer	250 flat washer	8
9	acorn nut 250-20		8
10	120MAC091	artwork containment plate	1

Loc.	Rev.	Description	Date
	1	Prototype Release	08/19/11
	A	Release to Production	07/10/12
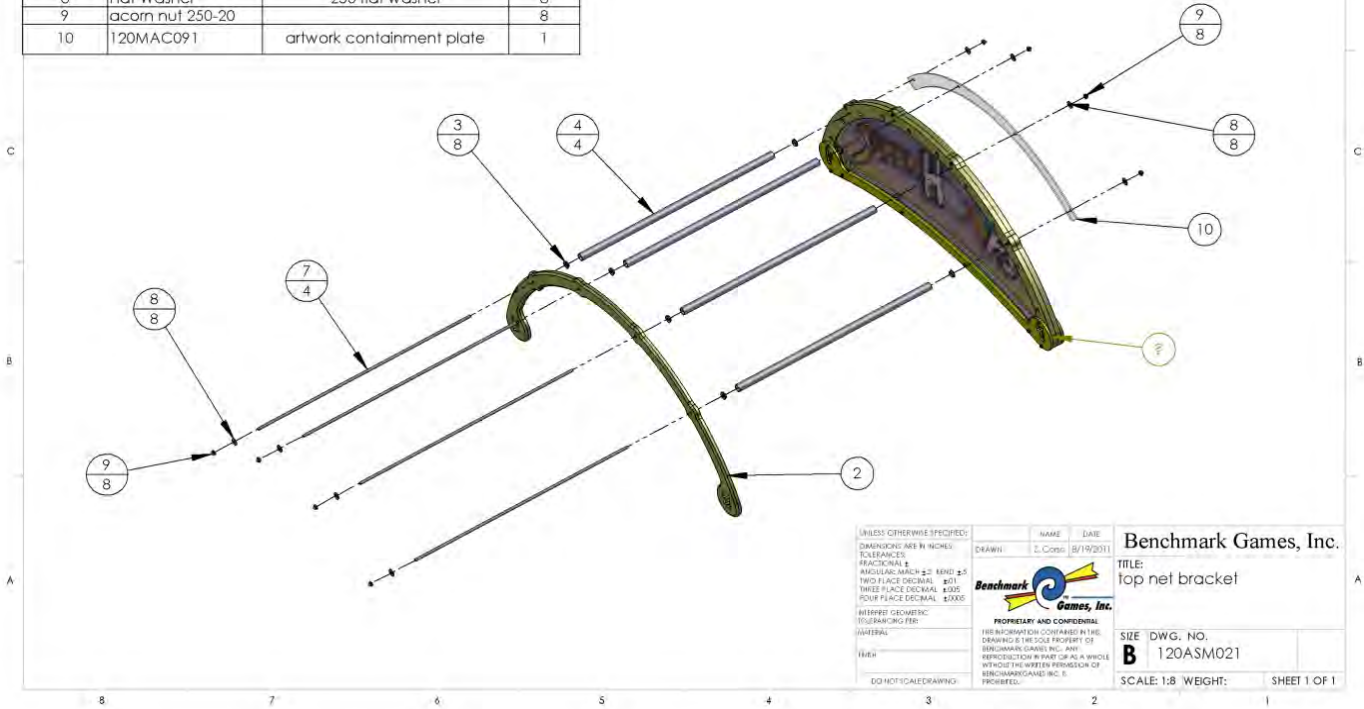
Benchmark Games, Inc.

TITLE: top net bracket

SIZE **B**   DWG. NO. 120ASM021

SCALE: 1:8   WEIGHT: SHEET 1 OF 1

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