



PARTS FAX (561) 493-2990

PARTS: (561)253-3311 SERVICE: (561)253-3310

WORLD'S PREMIER GAMES



MANUAL

**PLEASE READ FIRST BEFORE
PLUGGING IN MACHINE**

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US PATENT #7,507,152 B2



115MAN-001-A



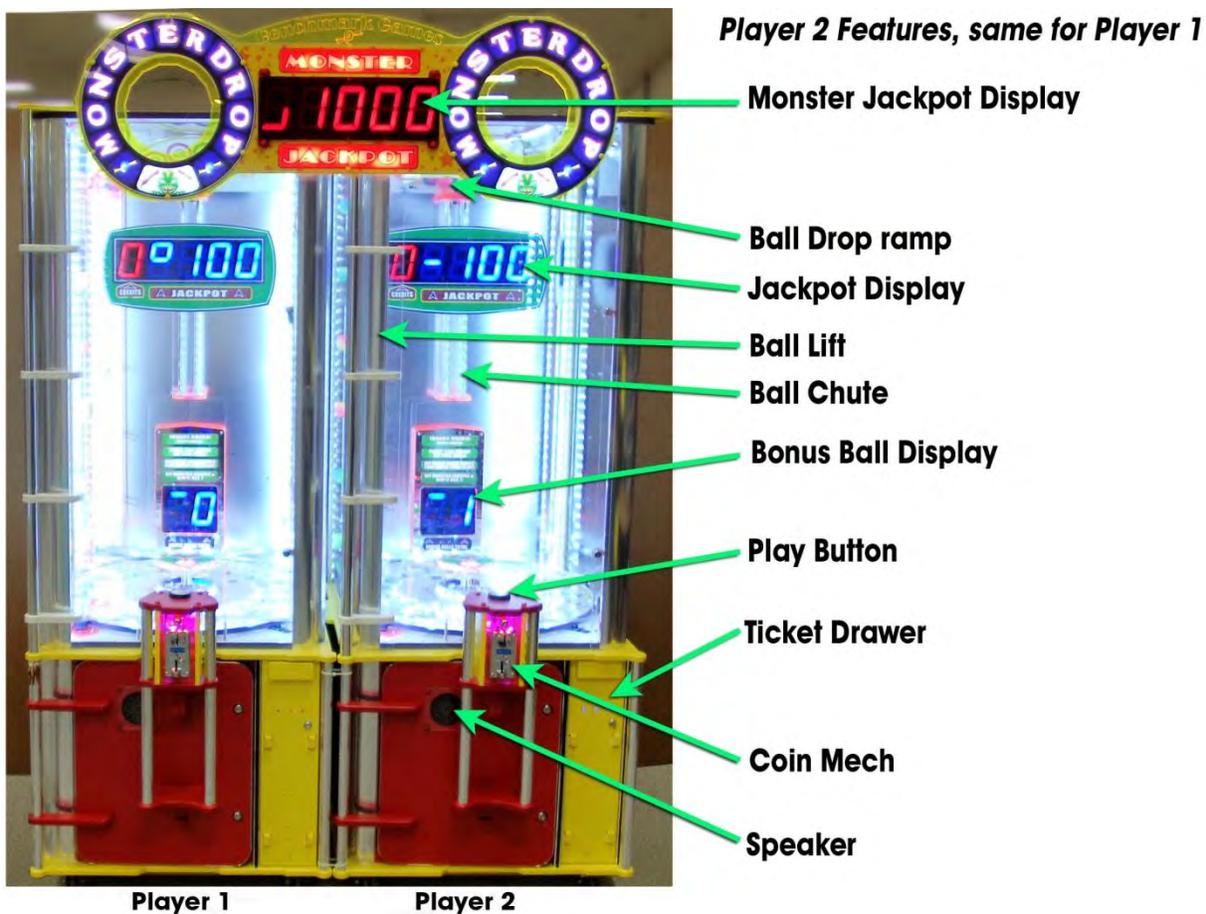
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Manual Revision History

Revision A-01/20/11-Release to Production

1-Basic Components



2-Game Setup

Unloading/Assembly

Carefully remove packing material and unload machine from pallet

Locate power cord shipped in the cash box. Connect cord to power input on the game. Plug cord into the wall. Toggle power switch to power game on.

-Run through the 'Programming Mode' options and define your desired settings, like credits settings, sound Volumes, etc (See Programming Options Section for defaults).

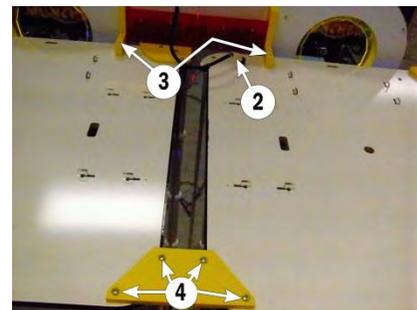
Separating Sides

The Monster Drop machine can be easily separated into smaller components when it is necessary to pass through doorways too small for the assembled machine. The machine separates into three main components: Player 1 side, Player 2 side, and Jackpot Marquee display.

To separate the machine:

1. Disconnect Joining Harness Connectors① located in the lower cabinet accessible through the lower front door.
2. Disconnect Jackpot Marquee Connector② located on the top of the machine behind the marquee.
3. Remove (2) Jackpot Marquee Mount Screws③ and remove marquee.
4. Remove (2) of the Cabinet Attach Bracket Screws④ and separate cabinet halves. If minimum size is desired, remove all four of the Cabinet Attach Bracket screws and remove Attach Bracket.

Reassemble in the reverse order of disassembly.



Top of Machine

Payout and Adjustments

*Note: Standard machine assumes 1 cent ticket value. Custom wheel values may be necessary if running anything different.

We recommend running the machine at the default factory settings as a starting point. The cost per play should be one coin at about a quarter value per coin. If your location has the right patron type, you may want to experiment with running the machine at two coins per play or more. Many locations will see an increase in revenue when set to two coins per play, especially where a card system is used for buying credits.

Here is how to configure the game for different credit values:

25 cent play

- Jackpot Increment-1 (default setting)
- Jackpot Start Value-100 (default setting)
- Monster Jackpot Increment-1 (default setting)
- Monster Jackpot Start 1000 (default setting)

50 cent play

- Jackpot Increment-2
- Jackpot Start Value-200
- Monster Jackpot Increment-2
- Monster Jackpot Start 2000

One Dollar Play

- Jackpot Increment-4
- Jackpot Start Value-400
- Monster Jackpot Increment-4
- Monster Jackpot Start 4000

Run the game for two weeks to properly average a payout percentage before adjusting anything as the machine may show false payout spikes due to jackpot hot or dry runs over short periods.

To increase the payout, increase the 'Jackpot Increment' setting described in the 'Programming' section. Each increment up will increase the payout by about 4% at \$0.25 per play, 2% at \$0.50 per play, or 1% at \$1.00 per play. Further adjustment can be made by increasing the 'Jackpot Start Value', 'Monster Jackpot Increment', or 'Monster Jackpot Start' values.

To decrease the payout, decrease the 'Jackpot Start' setting described in the 'Programming' section. Though not recommended unless absolutely necessary, further adjustment can be made by decreasing the 'Jackpot Start Value' or 'Monster Jackpot Start' values.

3-Game Play Sequence/Behavior

- I. Power-Up Initialization Sequence
 - a. Wheel begins spinning, displays and LED's light up, and ball lift may run to fill the ball trough if it needs a ball or balls.
- II. Attraction Mode:
 - a. Various lights and sounds are triggered at a programmable frequency
- III. Adding Money:
 - a. "Coin-in" or "bill-in" sound is heard on speaker.
 - b. When enough money is added to buy credit(s), the current credits value will be shown on the Jackpot display, and the game will enter Play-Mode
- IV. Play Mode:
 - a. Play sounds start
 - b. Play button flashes
- V. Player Hits Button:
 - a. Ball drops onto playfield
 - b. Ball Lift begins to run to replenish played ball
 - c. Ball lift stops when played balls are replenished in the ball trough

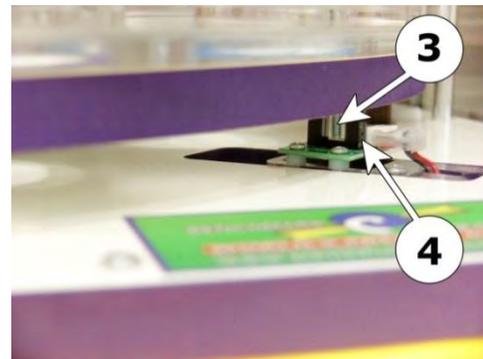
VI. Scoring/Payout

- a. Ball drops into hole on wheel or into Monster Jackpot hole
- b. Light and Sound celebration if Jackpot is hit or standard win sound when other value is hit
- c. Game pays appropriate tickets
- d. If player has more credits, the machine will continue on play mode, otherwise the game will go back into Attract-Mode.

4- TECHNICAL OPERATION

Wheel Location and Ball Scoring

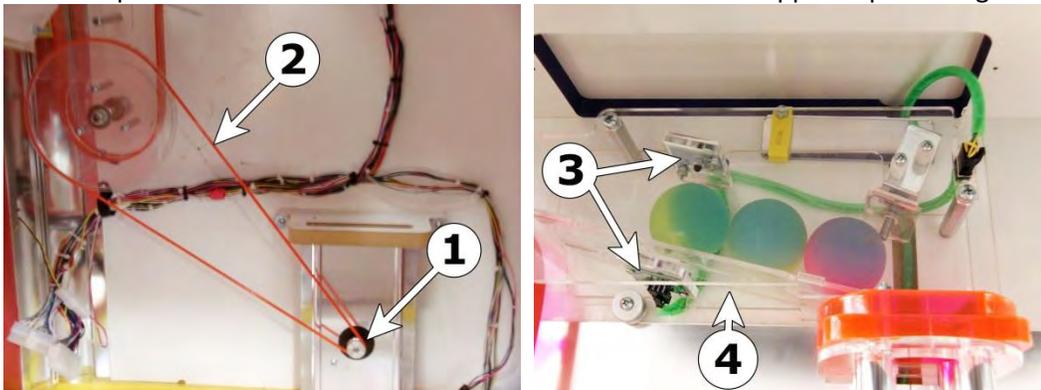
The playfield wheel① is driven by a stepper motor② using a friction drive. There is a pin③ positioned explicitly in the bottom of the wheel as a home position. The pin travels through an opto sensor④ mounted to the playfield underneath the wheel once per wheel revolution equating the motor step count to the wheel position. There is an opto sensor pair⑤ (transmit & receive) underneath the playfield⑥ to sense when a ball has fallen through the wheel. These sensors have a short harness connecting to sensor circuit boards⑦ located on the top side of the playfield so that the sensor status can be viewed.



Since the computer knows where the pin in the wheel is relative to each hole position and it knows how many motor steps from home to each hole, we know exactly which hole the ball fell through allowing a payout accurately corresponding to the hole position.

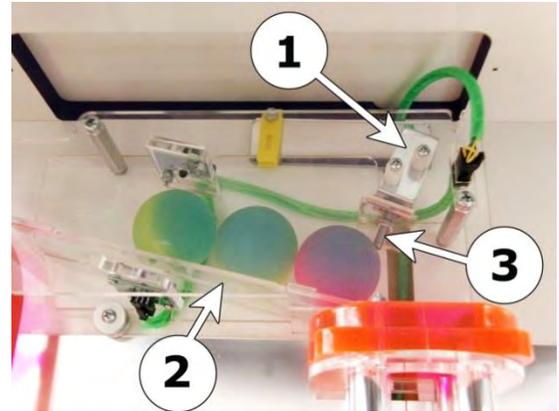
Ball Lift Operation

A stepper motor① is connected to the ball lift via a urethane round belt②. There is an opto pair③ (transmitter & receiver) located in the ball trough④ used to sense the presence or absence of a third staged ball. As long as there are three balls in the ball trough interrupting the opto, the ball lift will stay at rest. At any time, if there is no ball interrupting the opto the ball lift will run and continue to run until three balls are staged in the trough and the opto is blocked. The ball lift will run after each ball is dropped replenishing the third ball in the trough.



Ball Drop Operation

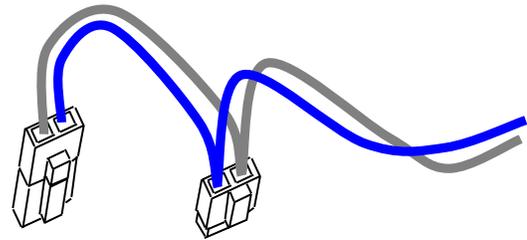
There is a solenoid① located above the ball trough②. The solenoid plunger③ directly contacts the first staged ball containing it in the trough. When credits are available and the play button is pressed, the solenoid is activated pulling the plunger up and away from the ball allowing it to roll out of the trough, down the ball chute, and into play on the wheel. The plunger returns just after the first ball is cleared in time to block the next staged ball and keep it from dropping until the play button is pressed again.



Inter-Board Communication

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

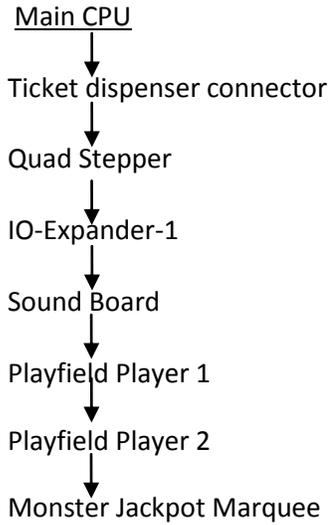
- On this machine, this wire pair has colors Blue and Gray.
- The Main CPU Board acts as the master, initiating commands and receiving responses from the slave boards.
- Like-boards differentiate from each other by means of an ID-Switch setting. See the following pages to find each board's ID-Switch location and setting.
- The following board(s) are 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:

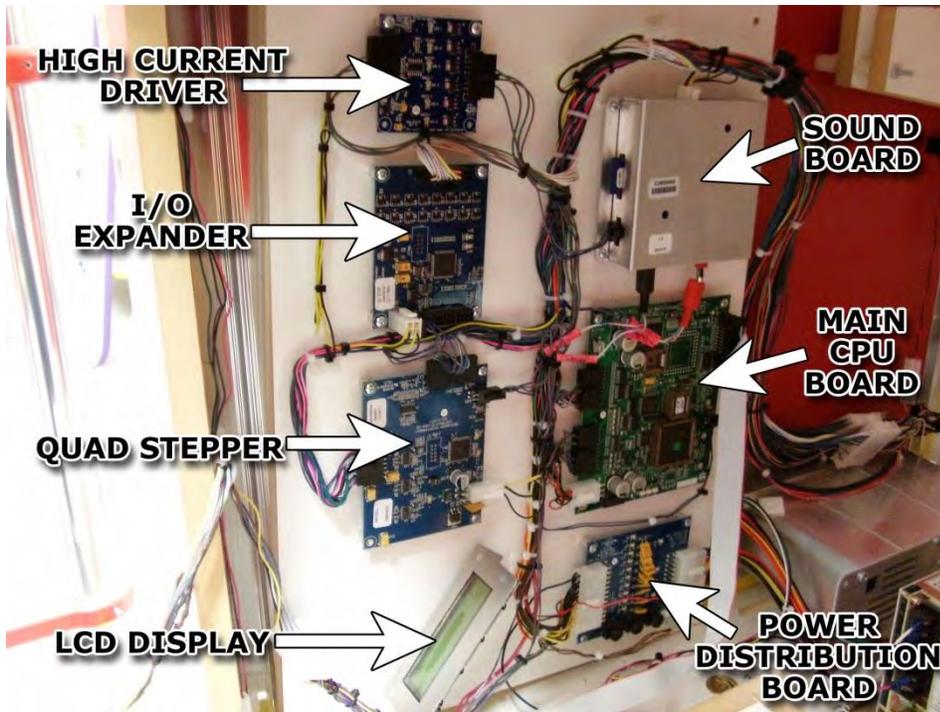
- > In some places the chaining is done by double-crimps at the connector (these are usually 2-pin connectors)
- > In other places, PCB traces on the board itself carry the chain from a pair of connector pins to the next (usually a four-pin connector); thus, disconnecting such a board's 485 might actually disconnect the rest of the 485 chain. Keep this in mind when troubleshooting or replacing parts.

-485 Communication network chain:

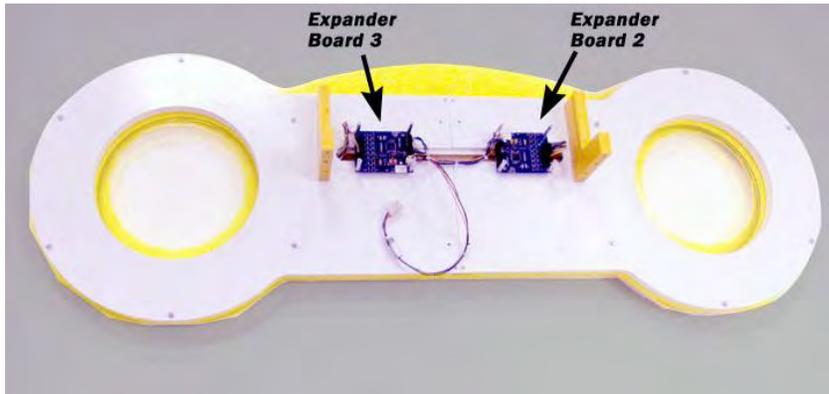


Main Electronic Components

Circuit Board Locations



This view inside the game with the lower door open.



This is a view of the back of the Marquee removed from game.

Electronics and Descriptions

Main CPU Board

Part# PCB10002

Location: Inside lower cabinet

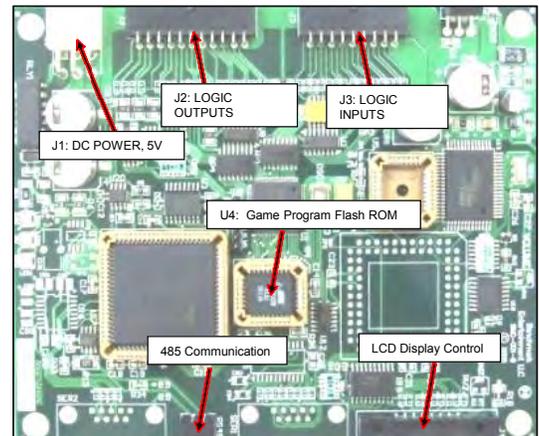
ID-Switch setting: None, this is the master board.

This board is the main controller of the game. It decides all the game actions and commands the other boards to act according to the game scheme.

Communication to the other boards is performed via a 485 differential wire-pair (Gray and blue wires).

The 'Programming Mode' game-settings information is also saved on this board.

The actual Game code resides on the removable Flash-Rom chip (U4); this chip can be replaced/upgraded if necessary (Using a PLCC32 extractor tool).



Main ROM program Version Updates:

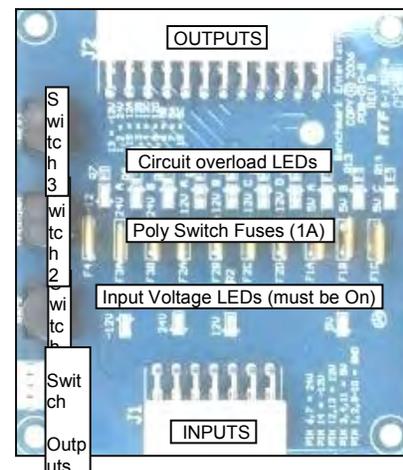
Power Distribution Board

Part# PCB17001

Location: : Inside lower cabinet

ID-Switch setting: None, board has no computer.

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.

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

<u>Board/Device</u>	<u>Estimated consumption</u>	<u>Fuse circuit (see board)</u>
-Quad Stepper Board (main CPU) + 4 Motors	(24V, 3A)	(*24A*)
-Sound Board (on Top Panel)	(12V, 140mA)	(*12B*)
-IO-Expander 1 (+Playfield Top Lights)	(12V, 500mA)	(*12C*)
-IO-Expander 2 (+Playfield Bottom Lights)	(12V, 500mA)	(*12C*)
-IO-Expander 3 (+Coin/Bill,light-strips)	(12V, 4A)	(*12A* + *12D*) [3A peak: Bill Acceptor]
- x3 Opto sensors (Trap Door Assy)	(5V, 60mA)	(*5A*)
- x2 Opto sensors (Claw Assy) + Credits Display	(5V, 160mA)	(*5B*)

Related Note:

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.

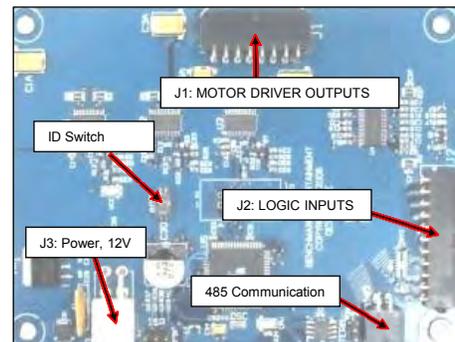
Quad Stepper 1

Part# PCB11006

Location: : Inside lower cabinet

ID-Switch setting: **00** (off-off)

This Stepper-motor controller board handles the movements of the two wheel motors and the two ball lift motors.



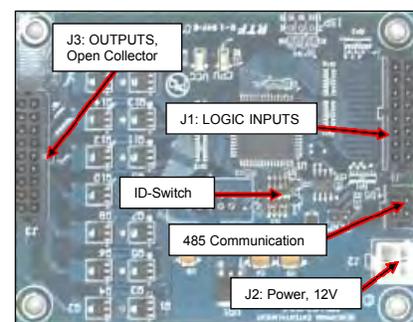
IO-Expander 1

Part# PCB14008

Location: : Inside lower cabinet

ID-Switch setting: **0100** (off-on-off-off)

Handles all LED’s located in the two main cabinet areas (all except marquee LED’s).



IO-Expander 2

Part# PCB14008

Location: Inside Marquee

ID-Switch setting: **0000** (off-off-off-off)

Handles the left half of the LED’s in the Marquee.

IO-Expander 3

Part# PCB14008

Location: Inside Marquee

ID-Switch setting: **1000** (on-off-off-off)

Handles the right half of the LED's in the Marquee.

Sound Board

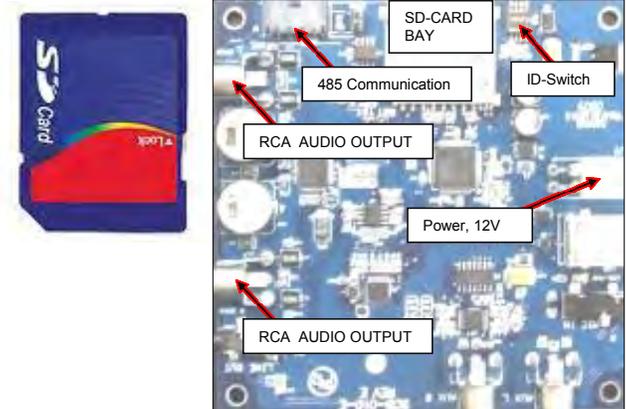
Part# PCB041

Location: : Inside lower cabinet

ID-Switch setting: **0000** (off-off-off-off)

Handles background and event sounds.

Sound files are stored on the plug-in SD-card memory board.



Opto Sensors

Part# PCB009 [Right Angle Connector]

Location: Underneath playfield wheel

Qty: x4

ID-Switch setting: None, it has no 485 communication.

It detects the wheel home position and the ball through the wheel.

Notes:

This sensor board has a Green LED that lights up when the IR beam is interrupted.

The two ball-sense signals go to the Quad stepper Board Inputs, J2 connector



Large 5-Digit Display

Part# PCB033

Location: (2) Inside play area mounted to back panels & (1) Inside Monster Jackpot display assembly

Qty: 3 (1 for Jackpots Player 1 and Player 2 & 1 for Monster Jackpot)

ID-Switch settings:

Jackpot/Credits Display Player 1: **000000** Jackpot/Credits Display Player 2: **010000**

Monster Jackpot Display: **001000**

The ID-Switch is located on the back of the Display and is labeled as "S1".



Large 2-Digit Display

Part# PCB034

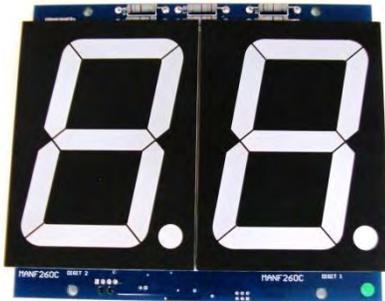
Location: (2) Inside play area mounted to back

Qty:2 (1 each for Bonus Balls Player 1 and Player 2)

ID-Switch settings:

Bonus Balls Display Player 1: **100000** Bonus Balls Display Player 2: **110000**

The ID-Switch is located on the back of the Display and is labeled as "S1".



Ticket Dispensers (Intelli-Triple Series)

Part#

Location: Ticket Side-Doors

Qty: x2 (1 for each player side)

IMPORTANT NOTE: These ticket dispensers for Monster Drop DO NOT use the standard "Run" and "Notch" lines to communicate with the main CPU Board; instead, they do it through the 485 comm. network.

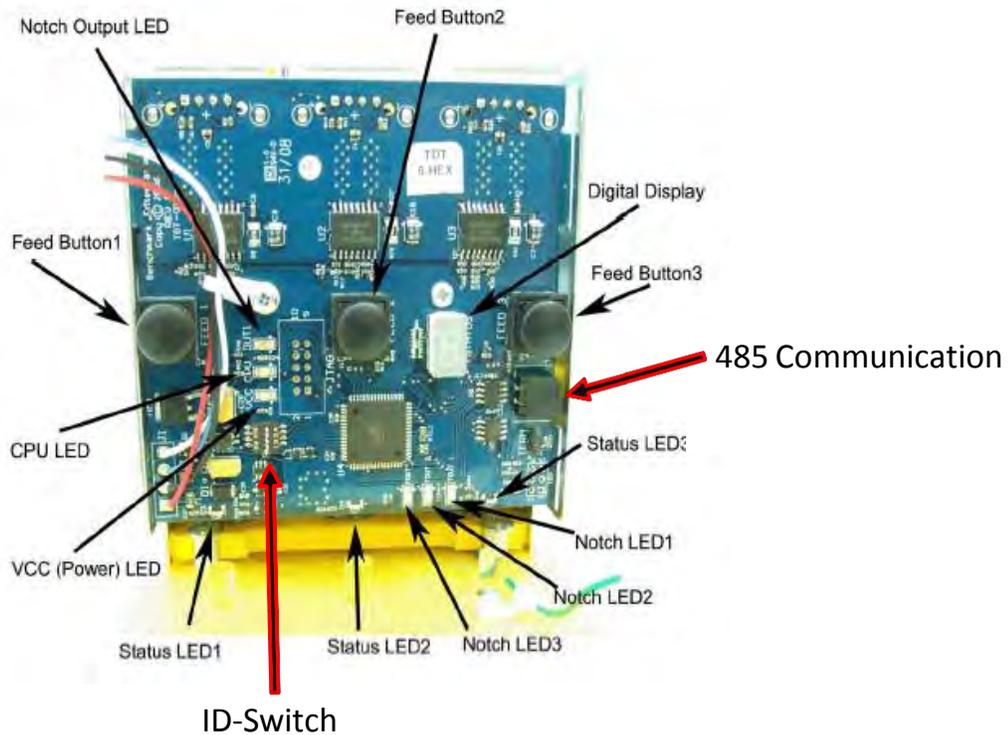
Because of this, you must be sure these devices have code version TDT 7 or higher (see sticker on PC-Board).

They also need to have the proper ID switch settings, as follows.

ID-Switch settings: Player 1: **000000** Player2: **100000**

The Circuit-board and ID-Switch within are part of the Ticket Dispenser device, on the underside.

For more information, see Benchmark's Ticket Dispenser manual.



Opto Single Receiver Board (Remote Receiver)

Part #: PCB044

Location: Playfield top rear

Qty: 2 (1 for each player side)

This sensor board connects to a remote sensor. It senses the balls falling through the wheel and playfield. This sensor board has an Opto Receiver connected to it (shown below).



Opto Receiver

Part # 115HNS014

Location: Playfield underside rear

Qty: 2 (1 for each player side)

This sensor connects to the 'pigtail' on the Opto Single Receiver Board shown above. The sensor device on this assembly is opaque black in color.



Opto Transmitter

Part # 115HNS015

Location: Playfield underside rear

Qty: 2 (1 for each player side)

This transmitter connects directly to the main harness. Note the physical difference between this assembly and the Opto Receiver is that this assembly has a resistor in series with the wire (hidden by shrink tubing) and the color of the device is translucent gray/blue while the receiver device is opaque black.



Opto Single Receiver Board (Onboard Receiver)

Part #: PCB021

Location: Ball Trough

Qty: 2 (1 for each player side)

This board mounts to the ball trough. It senses the third staged ball in the ball trough.



Opto Single Transmitter Board (Onboard Transmitter)

Part #: PCB020

Location: Ball Trough

Qty: 2 (1 for each player side)

This board mounts to the ball trough. It senses the third staged ball in the ball trough.



4- PROGRAMMING OPTIONS

Programming the Monster Drop Game

Entering Programming Mode

To enter program mode, press the Center Button located on the Power Distribution Board, located inside the left door on the left side of the cabinet. “MONSTER DROP V.X.X – PROGRAM MODE” will appear on the LCD Display located inside the cabinet next to the Power Distribution Board.

If there are tickets owed that have not been paid for either Game 1 or Game 2, then they will be displayed at this time with the option to clear them. To clear the tickets, depress the

Center Button again. If you wish to proceed without clearing the tickets, then depress either the Front or Back Button.

If there are no tickets to be cleared or you have opted not to clear them, then “ENTER PROGRAM MODE?” will be displayed. Depressing the Center Button again will enter the Program Mode. Depressing either the Front or Back Button will revert the game back to Run Mode.

If Programming Mode is selected, then “ENTER PASSCODE” will be displayed with the first digit highlighted with a flashing cursor.

“ENTER PASSCODE”

To be able to change programming parameters or reset the counters, a 4-digit passcode must be entered. The default passcode is 0000. To enter the passcode, depress the Center Button to change the digit from 0 to 9, then press the Front Button to move to the next digit. If you have moved to a new digit and wish to move back to a previous digit, depress the Back Button. After all digits have been entered correctly and the last digit is highlighted, depressing the Front Button will display the Programming Main Menu.

General Programming Procedure

Once a valid passcode has been entered and the Main Menu is displayed, the Front/Back Buttons scroll Forward/Backward through the programming options. If you wish to change an option, depressing the Center Button enters the highlighted option. The current setting for that option is then displayed.

Once an option is entered, the Front/Back Buttons Increase/Decrease the option value, and depressing the Center Button saves the new value and exits back to the Main Menu. If the Front/Back Button is held and depressed when changing an option, the value will continue to Increase/Decrease.

Description of Programming Options

1 CHANGE PASSCODE

Entering a new passcode is accomplished in the same way as entering the passcode, as previously explained.

IMPORTANT!!! ONCE THE PASSCODE IS CHANGED, THE DEFAULT OF 0000 WILL NO LONGER WORK! BE SURE TO SAVE THE PASSCODE IN A SAFE PLACE!

2 SET CONTRAST

This option sets the contrast for the LCD Display. Depress and hold either the Front or Back Buttons to Increase/Decrease the contrast. Depressing the Center Button returns to the Main Menu.

3 PLAY VOLUME

This option sets the speaker volume during game play. When this option is entered, the game’s background music will play continuously. Depressing the Front/Back Buttons will Increase/Decrease the volume. Depressing the Center Button returns to the Main Menu.

4 ATTRACT VOLUME

This option sets the speaker volume during Attraction Mode. When this option is entered, the game's background music will play continuously. Depressing the Front/Back Buttons will Increase/Decrease the volume. Depressing the Center Button returns to the Main Menu.

5 JACKPOT VOLUME

This option sets the speaker volume during a Jackpot Event. When this option is entered, the game's background music will play continuously. Depressing the Front/Back Buttons will Increase/Decrease the volume. Depressing the Center Button returns to the Main Menu.

6 ATTRA. FREQUENCY

This option sets the frequency at which the attraction mode occurs. The settings are from OFF to every 30 minutes, in 1-minute increments. Depressing the Front/Back Buttons will Increase/Decrease the setting. Depressing the Center Button returns to the Main Menu.

7 GAME PRICE

This option sets the number of coins required for a credit. The settings are from 1 to 8 coins per credit. Depressing the Front/Back Buttons will Increase/Decrease the setting. Depressing the Center Button returns to the Main Menu.

8 WHEEL TYPE

This selects one of the existing payout options. **PLEASE NOTE: Changing this from STANDARD requires a new wheel decal!** Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

9 WHEEL SPEED

This changes the wheel speed from 0 (slowest) to 4 (fastest). Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

10 JACKPOT INCREMENT

Every time a credit is added to the game, the jackpot value is incremented by this amount. The setting is from an increment of 1 to 50. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

11 JACKPOT START VAL

After a Jackpot is won, this is the new starting jackpot value. The values are from 50 to 999 in increments of 5. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

12 JACKPOT MAX VAL.

This sets the maximum allowable Jackpot Value. The values are from 50 to 999 in increments of 5. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

13 JACKPOT TYPE

The two types of Jackpots are SEPARATE and COMBINED. If the setting is SEPARATE, then the jackpot for each game operates independently from the other. If the setting is COMBINED, then both Game 1 and Game 2 Jackpots will increment if a credit is added to either game, and both jackpots will be reset if either Game wins a jackpot. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

14 MONSTER JP INC.

Every time a credit is added to either game, the Monster Jackpot value is incremented by this amount. The setting is from an increment of 1 to 50. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

15 MONSTER JP START

After a Monster Jackpot is won, this is the new starting jackpot value. The values are from 500 to 99999 in increments of 50. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

16 MONSTER JP MAX

This sets the maximum allowable Monster Jackpot Value. The values are from 500 to 99999 in increments of 50. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

17 DISPLAY TICKETS

If this option is ON, then the tickets owed are displayed on the jackpot display, and the display is updated as the tickets are dispensed. If there are no tickets owed, then the Jackpot Value is displayed. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

18 MERCY TICKET

The setting for this option are from OFF to 5 tickets. If the setting is OFF, then no tickets are dispensed if the ADD BONUS hole is hit. Depressing the Front/Back Buttons will change the setting. Depressing the Center Button returns to the Main Menu.

19 RESET TOTAL COINS

The TOTAL COINS IN counter can be reset here. Depressing the Front or Back Button will reset the count to 0. Depressing the Center Button returns to the Main Menu.

20 RESET TOTAL TKTS

The TOTAL TICKETS OUT counter can be reset here. Depressing the Front or Back Button will reset the count to 0. Depressing the Center Button returns to the Main Menu.

X LEAVE PROGRAM MODE

Depressing the Center Button returns to Run Mode

DEFAULT SETTINGS

PASSCODE	0000
PLAY MODE VOLUME	20
ATTRACTION MODE VOLUME	42
JACKPOT MODE VOLUME	MAX
ATTRACTION FREQUENCY	5 Minutes
COINS PER CREDIT	1 Coin
WHEEL TYPE	STANDARD
WHEEL SPEED	4
JACKPOT INCREMENT	1 Point
JACKPOT START VALUE	100
JACKPOT MAX VALUE	999
JACKPOT TYPE	SEPARATE
MONSTER JACKPOT INC.	1
MONSTER JACKPOT START	1000
MONSTER JACKPOT MAX	99999
DISPLAY TICKETS OWED	ON
MERCY TICKET	OFF

6- ALTERNATIVE TICKETING AND CARD-SWIPE SYSTEM CONFIGURATIONS

There are a few alternative configurations regarding Ticket Dispensers, Card Swipe systems and Electronic Tickets (e-tickets) that are possible to setup, depending on your location. These are described in a general fashion as follows.

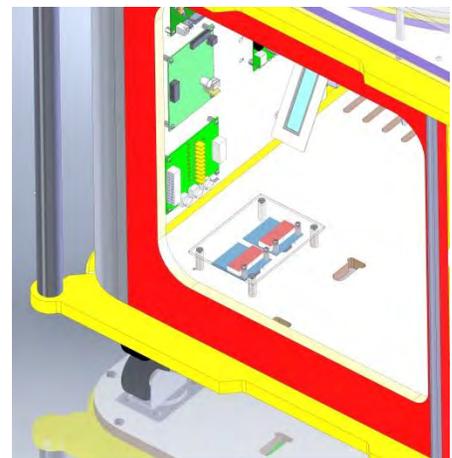
CONFIGURATION 1

NON-BENCHMARK GAMES TICKET DISPENSERS (DELTRONICS, etc): (USES BENCHMARK GAMES' EMULATOR BOARD AS INTERFACE)

The Monster Drop machine communicates with the Benchmark Games Ticket dispensers (Intelli-Triple) by means of a serial protocol over a 485 wire-pair physical path (gray and blue wire pair).

If you want to run your system with other manufacturer's Ticket Dispensers, you need to install one of our Ticket Emulator/Interface Boards to translate the communication coming from the 485 wire network into the standard "Run" and "Notch" signals used by each of your own Ticket Dispensers.

If not already present on the machine, the Emulator/Interface board for each of the 2 stations comes as a complete kit with the harnessing adaptor necessary for installation, (Kit part #105-KIT-005).



Attach the bracket to the board. Then connect the Emulator bracket harness to the game using the 8 pin microfit connector located above the power distribution board.

Finally, set the Dip-Switch Network ID on each of the interface boards in the same binary fashion as in the large 5-digit displays or the original Intelli-Triples, as follows:

Station 1: off,off,off,off Station 2: on,off,off,off

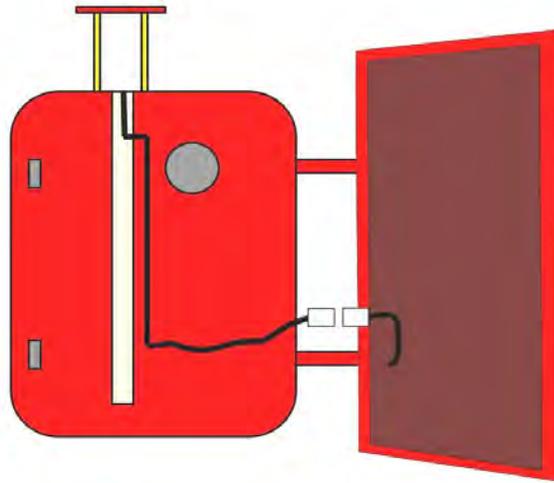
CONFIGURATION 2

NORMAL CARD SWIPE SET-UP, 1 SWIPE GIVES 1 CREDIT: **(THIS IS INDEPENDENT OF TICKET DISPENSER BRAND INSTALLED).**

The card swipe system needs to access the “Credits” signal line to the main CPU board, In order to trigger game-play.

In some installations, the card swipe system is also used for basic accounting purposes, having the device count the “Notch” signal pulses produced by the Ticket Dispenser as it awards tickets. In that case you also need to tap into this “Notch” line.

These two lines are available on pins at the door-hinge connector on each of the 2 player positions. Wires need to be run from the card swipe system to the corresponding mating connector on the door side. (The complete pin-outs and wire colors for each connector are listed on page 28)



Station 1: Credits, pin 5 (Gray/yellow)

Station 2: Credits, pin 5 (Gray/yellow)

Make sure to configure your card-swipe system to provide 1-pulse only for each swipe, with the following constraints:

-Minimum pulse duration: 40mS

-Minimum dead-time before next pulse: 40mS

Also make sure the Monster Drop Programming-Mode option “Coins per Credit” is set to 1.

DOOR-HINGE CONNECTOR PIN-OUTS:

CONNECTOR	DEVICE	TYPE	GENDER	WxH		
C7	door connection	Minifit	Female	5 x 2		
PIN	SIGNAL	WIRE COLOR	TO	Gauge	TO	Gauge
1	12v	Yellow	C1-4	18	C17-1	18
2	grnd	Black	C1-16	18		
3	drop ball button	Gry\Blk	C2-3	22		
4	button light	Gry\Blu	C1-12	22		
5	coin in	Gry\Yel	C2-1	22		
6	speaker	Wht\Red\Blu	C2-5	22		
7	speaker	Wht\Blu\Grn	C2-6	22		
8	coin mech enable	Gry\Or	C1-24	22		
9						
10						

CONFIGURATION 3

CARD SWIPE SYSTEMS, ELECTRONIC-TICKET SCHEME:

(NO TICKET DISPENSER INSTALLED)

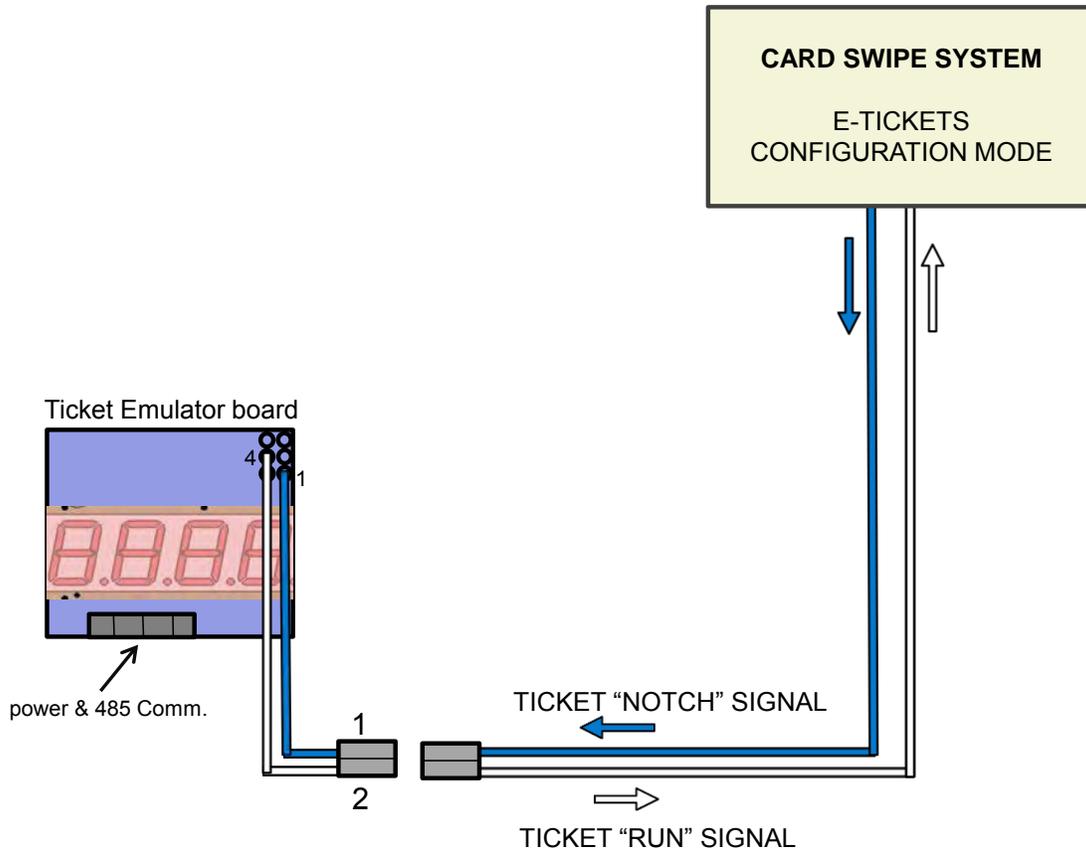
(USES BENCHMARK GAMES’ EMULATOR BOARD AS INTERFACE)

In most card swipe systems running E-ticket configurations (i.e. Sacoa, etc), the device requires to be fed the standard Ticket “Run” signal in order for it to log the tickets being paid to the player.

As it logs, the card swipe system will put out the standard “Notch” signal pulse for each ticket awarded, in order to behave and be compatible as a regular Ticket Dispenser.

As explained for Configuration 1, the Monster Drop machine runs tickets via a 485 network, thus the ticket emulator board is needed for this setup as well, in order to produce the “RUN” signal required by the card-swipe.

Note that the Ticket emulator board also Does require to see the “Notch” signal coming back for it to know that the customer is getting paid; otherwise it will report an “Out of Tickets” condition to the main CPU and the game will throw an E-3 Error.



7- ERROR CODES AND TROUBLESHOOTING GUIDE

ERROR CODES, QUICK SUMMARY

Shown on the corresponding player 5-Digit Display overhead.

Note: Errors are more clearly spelled out on the LCD display on the Control Panel.

ERROR CODES

The following error codes are displayed on the Jackpot Display for each game if an error occurs. In addition a description of the errors will be displayed on the LCD display inside the left cabinet.

E-1: HOME ZERO ERROR

This error occurs when the Wheel Home Sensor is continually grounded, indicating a ground in the harness or a defective Wheel Home Sensor.

E-2: HOME MAX ERROR

This error occurs when the Wheel Home Sensor never indicates that the home position on the wheel has been reached within a specified interval. This indicates either a break in the harness, a defective sensor, that the wheel is slipping excessively or not turning, or that the pin on the bottom of the wheel is not passing through the Sensor.

E-3: TICKET ERROR

This error occurs when the ticket dispenser is either jammed or out of tickets.

E-4: TICKET DISPENSER COMM. ERROR

This error occurs when communications cannot be established with the ticket dispenser.

Troubleshooting Guide

	Symptom- <i>Description of Proper Operation</i>	Possible Causes- <i>Action</i>	
	<p>Balls Don't drop when 'Drop Ball' button is pressed, but Light in button is flashing and credits are available-</p> <p><i>When button is pressed, ground is switched to the 'Drop Ball' input on the Main CPU. The CPU then switches the output for the solenoid to ground activating the solenoid. When the solenoid activates, the plunger is pulled up and out of the way of the ball.</i></p>	<p>Switch Problem</p> <ul style="list-style-type: none"> • Switch in 'Drop Ball' switch housing is loose-<i>secure switch in housing</i> <p>Solenoid problem</p> <ul style="list-style-type: none"> • Solenoid is stuck or not working-<i>Fix binding plunger or replace solenoid</i> • 12V power or ground to solenoid is not working or not connected-<i>fix voltage problem in harness, power supply, or power distribution board</i> 	
	<p>Ball Lift doesn't run and ball trough is empty-</p> <p><i>Ball lift should run when there are less than three balls in the ball trough. The third ball blocks the trough opto which switches the corresponding input on the Main CPU to ground. When the input is grounded, the CPU assumes there are three balls staged in the trough.</i></p>	<p>Main CPU sees a low on the input.</p> <ul style="list-style-type: none"> • Check that nothing is blocking the ball trough opto sensor-<i>clear obstruction</i> • Output from ball trough opto receiver is shorted-<i>replace opto receiver</i> • CPU input for ball trough opto receiver is bad-<i>Replace Main CPU</i> • Output wire between opto receiver and CPU is shorted in harness-<i>find short</i> 	
	<p>Playfield Wheel starts and stops, game does not score accurately or game just does not score accurately-</p> <p><i>Playfield wheel should run at a constant speed and the home opto pin located in the bottom of the wheel should pass through the home opto once per revolution. When the motor turns more times than it should between home opto triggers, the controller assumes the wheel may be stuck and slows the wheel down and tries to restart over and over.</i></p>	<p>Friction drive problem</p> <ul style="list-style-type: none"> • Check motor friction wheel contact on wheel-<i>fix any obstruction keeping spring from pulling motor to wheel</i> <p>Wheel home sensor problem</p> <ul style="list-style-type: none"> • Wheel home pin is missing or not passing through home opto-<i>replace or adjust pin height in wheel</i> • Wheel home opto sensor is not working-<i>replace opto or find open power or signal open in harness</i> 	
	<p>Ball Lift runs continuously and no balls are in ball trough or on ball lift</p>	<p>Ball lift ramp problem</p> <ul style="list-style-type: none"> • Balls stuck in ball lift ramp-<i>Clear any obstructions or ball hang ups in lower ramp in lower cabinet</i> <p>Balls worn small or no longer round</p> <ul style="list-style-type: none"> • <i>Replace balls</i> 	

Mechanical Drawings-Visit www.benchmarkgames.com for complete drawing set.

