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** Alien Daze and Captain Hero Tables are not available in Demo Version.

Mad Scientist

The plunger is a test-tube with a chemical solution in the bottom. The ball sits above the cork on a wire mesh. By pulling back on the plunger, you increase a flame beneath the test tube. The more the solution boils, the farther the ball goes when you "let go" of the plunger.

The following skill awards are given based on the Monster Target hit:

M	1 million and Plasma Field activated
O	Experiment started
N	500K points
S	100K points
Any other	50K points
Nothing	10K

The Shoot Again light is turned on and times out after 15 seconds.

When the ball drains, a bonus is calculated based on what you have achieved to that point:

Potions Mixed	50K each
Experiments Completed	250K each
Monster Parts	100K each

Your bonus amounts show as floating text over the drain area. If you're afraid to look skip the show by hitting a flipper. Be careful!

MAD SCIENTIST TABLE

TARGETS AND TARGET BANKS

SINKS, BUMPERS AND KICKOUTS

RAMPS AND CHUTES

LANES AND OUTLANES

EXPERIMENTS

MISCELLANEOUS

Mad Scientist Miscellaneous

SHOOT AGAIN LIGHT

SLINGSHOTS

TELEPORTER DIVERTER

MERCURY BATH

DA MONSTER

BALL RE-CAPTURE DEVICE

TOWER SPINNERS

PLASMA FIELD

FLASK

The Shoot Again light is between the bottom two flippers. When the ball is first put into play, the Shoot Again light turns on for 15 seconds. It begins flashing after 10 seconds. If the ball drains before the light times out, the ball is auto launched from the plunger. After 15 seconds the ball drains as normal.

There are two slingshots at the bottom of the table near the flippers. One is larger than the other, but they both award 400 points when hit.

Mad Scientist Sinks, Bumpers and Kickouts

BEETLE BUMPERS

IGOR SINK

WALL SINK

TELEPORTER SINK 1

TELEPORTER SINK 2

TOWER SINK

EINSTEINIUM KICKOUT

BAT TONGUE KICKOUT

FLASK KICKOUT

Three Beetle Bumpers are in the upper left of the table. They award 100 points per hit. Every ten hits increments the award by 1k, capping at 10K. This resets with each new ball.

Mad Scientist Targets and Target Banks

There are two target banks in Mad Scientist.

MONSTER TARGET BANK

PLASMA TARGET BANK

The Monster Target Bank has 7 drop targets in front of the monster's lab table. Each target is worth 15K. When all targets are dropped you get 150K and switch the Teleporter Diverter toward the Teleporter. The targets and Monster Lights are then reset. Now the targets award 30K each and 300K for all of them. The third time the award is 45K per target and 450K for the set. They cap at 60K per target and 600K for all of them. The targets reset when the ball drains.

The Plasma Target Bank contains two drop targets on the end of the middle bumper. Hitting either target turns on its Plasma Light and awards 25K points. Hitting both of them awards 150K and turns on the Plasma Field in front of the Lecithin ramp. When this plasma field is knocked down, another Plasma Field appears in front of the Yttrium Ramp. When this second plasma field is knocked down, a third field appears in front of the Mercury Ramp. The targets are reset when the third field is knocked down.

The Teleporter Diverter is on the Lecithin Ramp and guides the ball either to the Teleporter or back down to the right return lane.

The Igor Sink is underneath the Igor model, between the Lecithin and Yttrium ramps, on the main surface. Put the ball in here to start experiments.

The Wall Sink is above the left slingshot. It is an exit only sink for a ball in multi-ball play with a one way gate at the end.

Teleporter Sink 1 is in the wall at the upper right part of the table. If the Diverter is properly switched, a ball enters this sink and is sent to Teleporter Sink 2. However, balls are mutated by teleportation to a different shape. The ball keeps its new shape until it either falls into any sink, goes through the teleporter again, or drains. Teleporting a ball is worth 150K points.

The Teleporter Sink 2 is in the wall in the upper left corner. It is an exit only for balls that enter Teleporter Sink 1.

The Einsteinium Kickout is above the right outlane in the lower right part of the table. If the Extra Ball Light is on, it awards an Extra Ball and turns the light off. Otherwise it adds Einsteinium to the Flask and awards 40K points. If there is already Einsteinium in the Flask, you just get the points.

The Tower Sink is hidden under the tower. The ball will go in only if it's moving slowly enough. When a ball enters the sink, lightning strikes the tower. You get 50K each time through.

Mad Scientist Lanes and Outlanes

LEFT RETURN LANE

RIGHT RETURN LANE

LEFT OUTLANE

RIGHT OUTLANE

The Left Outlane is the left-most lane in the lower left corner of the table. It awards 25K each time through.

The Right Outlane is the right most lane. It awards 25K points each time through.

The Left Return Lane is the inner most left lane in the bottom left of the table. It awards 10K each time through and turns on the Re-Capture Activation Light above it. If both Re-Capture Activation Lights are lit, then they are turned off, the Ball Re-Capture Light is turned on, and the Ball Re-Capture Device is activated.

The Right Return Lane is the inner most right lane in the bottom right of the table. It awards 10K each time through and turns on the Re-Capture Activation Light above it. If both Re-Capture Activation Lights are lit, then they are turned off, the Ball Re-Capture Light is turned on, and the Ball Re-Capture Device is activated.

Mad Scientist Ramps and Chutes

MERCURY RAMP

TELEPORTER EXIT RAMP

FLASK RAMP

LECITHIN RAMP

YTTRIUM RAMP

FLASK CHUTE

TOWER CHUTE

The Yttrium Ramp leads from the below the Tower Model to the left side of the table, then down to the left return lane. If you're not in an experiment, this adds Yttrium to the Flask and awards 40K points. If Yttrium is already in the Flask, you just get the points. The Yttrium Combination Light is turned on. This light times out in 10 seconds. Each time you put the ball back up the ramp before the timeout, the timer is reset and you are awarded 80K the first time, 120K the second time, 160K the third time, to a max of 200K for the fourth time.

Put the ball on the Mercury Ramp to allow the ball to fall into the Mercury Bath.

This exit ramp leads down from the upper left corner above the Flask. It has a one way gate at the end. Enter it from the Teleporter Sink 2.

The Flask Ramp leads straight up from the Flask Kickout to the Flask.

The Lecithin Ramp leads from the center of the table into either the Teleporter or down the right return lane. If you're not in an experiment, it adds Lecithin to the Flask and awards 50K points. If Lecithin is already in the Flask, you just get the points. It also turns on the Lecithin Combination Light, which times out in 10 seconds. While the light is on, each time you put the ball up the ramp the timer is reset and you get 75K for the first time, 150K for the second, 250K for the third time and 300K maximum for the fourth.

The Flask Chute, between the Lab Table and the Tower Chute, provides access to the Flask Kickout.

The Tower Chute runs between the Flask Chute and Lecithin Ramp to the right side of the table and provides access to the Tower Sink.

The Bat Tongue Kickout is in front of the lower bumper. If you're not in an experiment, this adds Bat Tongue to the Flask and awards 75K points. If Bat Tongue is already in the Flask, you just get the points.

The Flask Kickout is at the end of the Flask Chute. When you enter the kickout, you are given a choice: either mix the "elements" currently in the Flask (left flipper) or clear the elements (right flipper). If you mix, the ball is kicked into the Flask Ramp. If you clear, you are awarded 50K for each element in the Flask and the ball is ejected. If there are no elements, or if you are in an experiment, you are awarded 40K points and the ball is ejected.

The Mercury Bath is in the middle left part of the table. It serves the following services in order of precedence. Only one can be active at any time:

First:

If Cloning light is on, then every ball that drops into the Mercury Bath puts out two onto the table. This is repeated as long as the Cloning light is on and there are no more than 5 balls on the table.

Second:

If the Mercury Combination Light is on, you are awarded 50K for the first ball, 100K for the second, 150K for the third and a max of 200K for the fourth. The light times out after 10 seconds, but it's reset every time a ball goes in the bath.

Third:

If the Mercury Combination Light is not on, you are awarded 25K points and the Mercury Combination Light is turned on.

The Lab Table is in the top middle of the game. It starts out empty. Different experiments add body parts until the Monster is brought to life during the final experiment.

If the Ball Re-Capture Light is on, then your ball is captured when it drains. After 2 seconds, it's shot back onto the table and the device is turned off. No points, but you get your ball back.

The three spinners located in the Tower Chute are worth 2k per spin and add 10K to the Jackpot.

The Plasma Fields cover entrances to the Lecithin, Yttrium and Mercury Ramps in turn. Each field awards 250K points when the ball is sent through, then "moves" to the next ramp.

When the ball falls into the Flask in the upper left corner of the table, the elements in the Flask are mixed, with the following results:

	10K	25K	50K	100K	250K	500K (max)
Einsteinium only	add 500K to Jackpot					
Lecithin only	open teleporter diverter					
Yttrium only	increment bumpers					
Bat Tongue only	turn on shot again light for 30 seconds					
Einsteinium and Lecithin	turn on Cloning Light					
Einsteinium and Yttrium	Max bumpers					
Einsteinium and Bat Tongue	Increment Table Multiplier					
Lecithin and Yttrium	Activate Plasma Field					
Lecithin and Bat Tongue	500K					
Yttrium and Bat Tongue	Extra Ball Light					
Einsteinium and Lecithin and Yttrium	add 500k		add 500K to			
jackpot						
Einsteinium and Lecithin and Bat Tongue	One Million Points					
Einsteinium and Yttrium and Bat Tongue	Multi-ball					
Lecithin and Yttrium and Bat Tongue	Maximum table multiplier (5x)					
All four Elements	Extra ball and a million points the first time, a million points given to you and the jackpot each additional time.					

Mad Scientist Experiments

Start an experiment by putting the ball in the Igor Sink (unless you're already in the middle of an experiment. Scientists are rather focused.) Experiments are selected randomly. Once attempted, an experiment cannot be repeated until all other experiments have been attempted. The Bring the Monster to Life experiment cannot be started until all other experiments have been successfully completed, creating enough of a monster to bring to life

Just for starting an experiment you get 150K points. Experiments can be extended by 10 seconds by putting the ball in the Igor Sink again.

<u>Experiment A:</u>	<u>Fight an Angry Mob</u>
<u>Experiment B:</u>	<u>Raid the Graveyard</u>
<u>Experiment C:</u>	<u>Get a Brain for Your Monster</u>
<u>Experiment D:</u>	<u>Create Elixir of Life</u>
<u>Experiment E:</u>	<u>Bring the Monster to Life</u>

Collect body parts by putting the ball in the Bat Tongue Kickout and the Yttrium Ramp. As each part is collected, it appears on the lab table. You have 35 seconds.

Bat Tongue Kickout	Head, Left arm, Left leg	125K points each
Yttrium Ramp	Torso, Right arm, Right leg	75K points each

Each drop target on the table is replaced by the pitchfork of an angry towns person. There are 9 drop targets. You must hit five targets to actually complete the experiment, but it will continue until it times out or you hit all the targets. The first target is worth 50K, and each additional target is worth an additional 10K points.

Find a suitable brain for your monster - harder than you might think. There are many choices on the table, each representing a different quality of brain.

From the Mercury Ramp (a neighbor's farm):

Chicken (5 IQ)	Cow (10 IQ)	Sheep (15 IQ)	Pig (20 IQ)
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From the Lecithin Ramp (Joe's Brain and Lube):

Damaged (35 IQ)	Used (45 IQ)	Bargain (55 IQ)	Designer (65 IQ)
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From the Yttrium Ramp (Local morgue):

Programmer (75 IQ)	Abnormal. (85 IQ)	John Doe (95 IQ)	Jane Doe (105 IQ)
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From the Tower Sink (Governmental Research Facility):

Monkey (140 IQ)	Scientist (160 IQ)	Artificial (180 IQ)	Einstein (200 IQ)
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Each time a component is hit, the next highest IQ brain from that component is provided. When you get a brain with a higher IQ, the lesser brain is tossed aside. Any brain will suffice for the final experiment. You are awarded 2k points per IQ level. The experiment lasts 25 seconds.

You must brew the Elixir of Life to bring your monster to life. You must have each element (Yttrium, Lecithin, Einsteinium and Bat Tongue) in your flask. You can start with any that were in your flask when the experiment started and add the ones you don't have. Mix the ingredients by putting the ball into the Flask Kickout. The first ingredient added to the elixir is worth 100K. Each additional ingredient is worth an additional 50K points, regardless of order. You are awarded 500K for mixing them all. You have 35 seconds. Get busy!

AT LONG LAST!! With each Monster Target hit, the disjointed pieces of your creation are connected. When all the targets have been hit, you must hit the Tower Sink to cause lightning to strike the electrical tower. Your monster comes to life. This experiment lasts until completed (or the ball drains).

Each monster target awards 100K points

If you hit the Tower Sink and bring your "friend" to life, you are awarded the jackpot.

Alien Daze

The plunger is your ray gun in the lower right corner of the table. The ball is shot at the Crop Circle in the upper left. There are four possible results:

MISS THE CORN FIELD	10K POINTS
ENTER HOLE 1	75K POINTS
ENTER HOLE 2	500K POINTS AND 2 BALL MULTI-BALL (EXTRA BALL ON BALL 3!)
ENTER HOLE 3	250K POINTS

When a ball drains, your bonus is based on what you have achieved to that point. A summation of your bonus is shown with floating text. Skip the summation with a flipper hit. Good luck!

MISSIONS COMPLETED	200K PER EACH MISSION
SHIP LANDED	100K EACH
ABDUCTEES	20K EACH
ARTIFACTS TRADED	10K EACH
ENCASEMENTS	100K EACH
BONUS HOLD	BONUS FROM PREVIOUS BALL

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Extra Balls and Miscellaneous

Here are the rules for some odds and ends that add flavor and challenge to Alien Daze:

EXTRA BALL

SLINGSHOTS

JACKPOT SPINNER

RESERVE POWER MODULE

STUN MAGNET

Alien Daze Targets and Target Banks

SPACE ALIEN TARGET BANK

LANDING GEAR TARGET BANK

UFO TARGET BANK

RE-CHARGE TARGET

CORNFIELD TARGETS

The Alien Daze Targets are the six drop targets along the lower left of the table. Each target is worth 5K the first time you hit them (with the last target worth 50K). The second time through each target is worth 20K with the last target worth 100K. The third time each target get you 45K, with 150K for the last one. Each set increases the table multiplier, to a max of 3x.

The Landing Gear Target Bank has four spot targets in front of the spacecraft. When the spacecraft has not landed, each target is one piece of landing gear. Hitting a target turns on its respective Landing Gear Light. Once the craft has landed, the Landing gear lights are reset. Hitting a target when the craft has landed allows you to use the Spacecraft Lock. One ball can be locked for each landing gear light. Each target is worth 7500 before the craft has landed, or 15K after it has landed.

The UFO Target Bank contains three drop targets in front of the lowest bumper. Dropping each target turns on a UFO light. When all targets are down the Stun Magnet in the center of the table turns on. The UFO targets are reset when the Stun Magnet itself is reset. Each target awards 10K points, and the whole group awards 50K points.

There are two Re-Charge Targets. The first one you hit is worth 6k. The second is worth 15K. When both are hit, one of the three recharge lights comes on and activates the reserve power module.

The Cornfield Targets are two spot targets at the entrance of the Cornfield Ramp. Each one turns on the Cornfield Ramp Light in front of it and awards 10K points. If both are hit, the Extra Ball light is turned on and 30K points are awarded.

Sinks, Bumpers and Kickouts

SPACECRAFT SINK

TRADE SINK

TRAILER PARK BUMPERS

TRACTOR BEAM KICKOUT

The Spacecraft Sink, at the end of the short ramp leading under the space craft, is accessible only when the spacecraft has landed. If the Spacecraft Lock Light is not on, the ball is ejected from the vertical ramp at the center of the ship and put near the bumpers, and 50K points are awarded. If the Spacecraft Lock Light is on, then each ball into the Spacecraft sink turns off a landing gear light and locks the ball. Up to four balls can be locked. You get 100K points for each one. The fifth ball starts a five ball multi-ball set. Each ball teleports from the spacecraft to a spot on the table.

The Trade Sink is on the right side of the table at the end of the chute with the spinner. Trade one of your alien artifacts for some earthling item chosen at random. The ball is held and you are asked: "Trade Alien artifact for XXX? Right flipper for Yes, Left flipper for No". XXX refers to the earthling item. You must decide (some say guess) whether it's a good trade for you. The ball exits from the Spacecraft Exit sink if you accept, or from the Trade Sink if you don't. A good trade is worth between 50K and 100K. A bad trade is worth half that. The list of earthling items is extensive, and you'll have to figure it out on your own. Good luck!

Chutes and Ramps

CORNFIELD (CROP CIRCLE CHUTE)

TRADE CHUTE

SPACECRAFT EXIT CHUTE

CORNFIELD RAMP

LANDING RAMP

LOOP RAMP

TRAILER PARK RAMP

The crop circle chute is in the upper left of the table. If the ball is going slowly enough, it drops into one of the three holes at the bottom of each bend in the chute.

Hole 1 20K points

Hole 2 Starts or extends the current game mode, or awards extra ball if lit

Hole 3 75K points

The ball is ejected from the Spacecraft Exit Sink, except during Cornfield multiball skill shot, when one ball is launched from the Spacecraft Exit Sink and the other from the Trade Sink.

The trade chute is on the right side of the table, with the spinner in it.

The Spacecraft Exit chute is behind the bumpers and spaceship. This leads from the back of the ship to the top of the bumpers. It's an exit path only. You can't launch a ball into it.

The Cornfield Ramp is above the Corn Field. The ball exits above the upper left flipper. Each time through the ramp, one more cornfield Combination light is turned on. When all three lights are turned on, then the Bonus Hold is turned on. The lights each time out after 15 seconds, and are reset by a new ball. The ramp awards 50K points if no cornfield combination lights are lit, 100K points for one light, 200K points plus the Bonus Hold award for two lights, 400K points for three lights.

The Landing Ramp is at the left side of the spaceship. The ball drops out above the upper left flipper. The quality of your landing is determined by how much landing gear is down:

No gear	25K points
One piece of gear	50K points
Two pieces of gear	100K points
Three pieces of gear	250K points
Four pieces of gear	500K points

When the ship lands, all landing gear lights are turned off. If landing the ship is an option, the Landing Combination Lights flash. If the ship has already landed, your award is based on the number of times through the ramp. Landing Combination Lights time out after 20 seconds:

No Landing Combination Lights	75K points
One Light	150K points
Two Lights	300K points plus Shoot Again light is turned on for 30 seconds
Three Lights	600K points

The Loop Ramp is at the right side of the spaceship. The ball loops upside down and drops into the right return lane, turning on another Loop Combination Light with each pass:

No Loop Combination Lights On	40K
One Loop Combination Light on	80K
Two Loop Combination Lights on	160K plus Extra Ball Light is turned on
Three Loop Combination Lights on	320K

Loop Combination Lights time out after 10 seconds.

A ball running through the Trailer Park Ramp exits straight up from the center of the spaceship, and drops out in the middle of the top three bumpers.

There are four bumpers in the upper right corner of the table. Every twelve times the bumpers are hit, the Tracker Beam Kickout is uncovered (unless in a mission). The bumper scores increment by 1500 per bumper every third time you go up the gangplank (not counting ball locks). The increment caps at 7500.

The Tractor Beam Kickout is centered between the lower three Trailer Park Bumpers. Most of the time, the Tractor Beam kickout is covered. Every 12 times the Trailer Park Bumpers are hit, the door of this kickout slides back. If a ball goes into the kickout, it's teleported into an empty Encasement Slot against the back of the table. The kickout is covered again and a new ball is automatically launched. The first ball is awarded 100K points, the second ball is awarded 200K points, and so on. The eighth encasement gives both you and the jackpot a million points. Then the encasements are emptied, ready to fill again.

Lanes and Outlanes

LEFT OUTLANE

RIGHT OUTLANE

LEFT MIDDLE RETURN LANE

LEFT RETURN LANE

RIGHT RETURN LANE

The left most lane at the bottom of the table awards 10K points.

The right most lane at the bottom of the table (excluding the plunger chute) awards 25K points.

The middle left lane at the bottom of the table awards 10K points.

The innermost left lane at the bottom of the table awards 5K points.

The innermost right lane at the bottom of the table awards 5K points.

On the final ball (unless it is an extra ball), the Extra Ball Light flashes. Shooting the ball into the middle hole with the plunger does not award the multi-ball. Instead, it awards an extra ball and turns off the Extra Ball light. If the hole is missed, the Extra Ball Light turns off.

The two slingshots in the lower center of the table, above the flippers, award 350 points per hit.

When the ball locks onto the Stun Magnet in the center of the table, Stun Lights rotate around a circle until a flipper is hit. The ball is then launched in the direction of the last Stun Light and the magnet is turned off. It is reset when the ball is launched or lost. Landing on the magnet awards 250K points.

The Jackpot Spinner near the Trade Chute on the right side of the table awards a thousand points to you and 15K to the jackpot.

The Reserve Power Module is in the left outlane below the left middle return lane. When activated by the recharge targets, a ball in the left outlane is held by the device and kicked up through the left middle return lane. One of the Re-Charge lights is turned off. When no Re-Charge lights are on and the device is not activated, the ball passes through and drains.

Missions

Missions are started by putting the ball into the hole of the centermost ring in the Cornfield, and are selected randomly. The name of the mission and the time left to complete it appear in floating text outside the table area. Starting a mission awards 100K points. Once a mission has been played, it cannot be played again until all other missions have been played through.

A mission can be canceled from the Trade Sink. When you are in a mission and enter the Trade Sink, you will be given the choice to Extend the Mission (using the left flipper) or to Cancel the Mission (using the right flipper). An extended mission lasts an additional 15 seconds. A canceled mission is not recorded as completed.

MISSION A:MAKE CROP CIRCLES

MISSION B:ABDUCT HUMANS

MISSION C:RE-CAPTURE BIGFOOT

MISSION D:TAKE A JOY RIDE

MISSION E:RE-ASSEMBLE ABDUCTEE

Mission A: Make Crop Circles

Create the largest crop circles possible by putting the ball into the Crop Circle Ramp. Inner-most circle creates the smallest, the outer-most creates the largest. The ball exits from the Trade Sink. Points are awarded in incremental amounts. You have 30 seconds

Small Crop Circle	50K	75K	100K	125K	150K (max)
Medium Crop Circle	200K	400K	800K	Extra Ball (once)	
Large Crop Circle	100K	200K	300K	400K	500K (max)

Mission B: Abduct Humans

Abduct various humans and items the earthlings hold near and dear. Each target (excluding Bigfoot targets) becomes an abductee - both spot and drop targets. Each abduction is given an award of 20K points, plus an incremental 2k per abduction (thus for example, the third item abducted is awarded 20K plus 6k points). The awards are capped at 100K points. There are dozens of items, and you won't find them listed here. This mission lasts 25 seconds.

Mission C: Recapture Bigfoot

Bigfoot escapes from your spacecraft. You must retrieve him before too many news photographs are taken. Single pop-up Bigfoot targets appear for 5 seconds, each in a random area of the table. In between these popups, Bigfoot footprints appear on the table, making a path to the next appearance (unless he's been hit). Awards 100K points per each Bigfoot hit. An additional 100K is added to the Jackpot. This mission lasts 35 seconds.

Mission D: Take a Joy Ride

Cruise the world - and beyond - in your spaceship. You have 25 seconds to finish joy ride in any of the following three ways:

Fly-By - Put the ball in the crop circle center hole. You are awarded 75K each time. There are nine different things you can buzz before the list repeats.

Play Tag - Hit all three UFO Targets. You get 25K for each hit. When they all drop, you get a million points and can play tag with one of nine different targets.

Goof Around - Hit the Loop Ramp You get 50K for each hit. The ninth time through is particularly hopeful.

Mission E: Re-Assemble Abductee

Re-assemble dissected abductee in time to make it back to the Mothership. Correct body parts replace Alien Daze Targets. You must knock down these targets to re-assemble the abductee. Incorrect body parts replace UFO Targets. Mission lasts until you either assemble the abductee, then release (or eat) the unfortunate, or the ball drains.

Alien Daze Targets become:

- Right Leg
- Right Arm
- Left Leg
- Left Arm
- Head
- Torso

UFO Targets replace body parts:

- Cow Head (replaces head)
- Chicken Feet (replaces left leg)
- Tentacles (replaces right arm)

Extra Points for implanting a tracking device by hitting the Trade Sink

After an abductee has been re-assembled, it is released (by hitting the Landing Ramp), or eaten (by hitting the Loop Ramp).

Awards are as follows:

Each Correct Body Part	100K points
Each Incorrect Body Part	50K points
Complete Correct Assembly	400K points
Complete Incorrect Assembly	200K points
Tracking Device	250K points
Release	Jackpot
Eat	Jackpot

Captain Hero

The Plunger, a phone booth with the ball inside, is in the lower right corner. There's a hidden sink behind the Downtown Diverter. You get a skill shot bonus of 10K if you don't make it past the sink. You get 50K if you go past the sink. If you enter the sink, you're awarded something randomly selected from a short list.

When the ball drains, your bonus is calculated based on what you have achieved to that point:

VILLAINS BATTLED	100K EACH
VILLAINS CAPTURED	250K EACH
BUILDINGS STANDING	50K FOR EACH ONE NOT IN RUBBLE

You can see your bonus scores in floating text over the drain area. Hit a flipper if you don't want to watch. Enjoy the game!

Captain Hero Table

Targets and Target Banks

Sinks, Bumpers and Kickouts

Ramps

Lanes and Outlanes

Battles

Miscellaneous Stuff

Captain Hero Targets and Target Banks

SUBWAY TARGETS

DYNAMITE TARGETS

ALLEY TARGETS

SIDEKICK TARGET BANK

@-RAY VISION TARGET BANK

HIDDEN TARGETS

PLATFORM TARGETS

DOWNTOWN TARGET

There are two targets, one in front of each Subway Sink. You are awarded 25K points for the first target, 50K for the second. These targets stay down until a mode starts or both Subway Sinks have been hit. The respective Subway Light is flashed when its target drops and stays flashing until the ball goes into the Subway sink.

The four Dynamite Targets are in the Dynamite Alley, back to back, and explode when hit. The first target awards 20K points, the second awards 40K, the third awards 60K, and the fourth awards 80K. Targets are reset when a battle starts or the ball drains.

The Alley Targets are the two spot targets on either side of the Dynamite Alley. Each hit turns on the Alley Light in front of that target. If both lights are on, the next time you hit a target the Downtown Diverter is switched and both Alley Lights are turned off. The first target hit awards 25K. The second target hit awards 40K and the diverter switch.

The Sidekick Target Bank contains the three spot targets on the right side of the buildings below the upper right flipper. First two are worth 25K, and the final target is worth 75K.

The @-Ray Vision Target Bank contains the four spot targets in the Uptown part of the table, to the right of the Uptown Alley. Each target awards 25K, with the last one giving you 75K. When all targets have been hit, a Hidden Target appears.

This spot target between the Downtown Ramp and Uptown Alley is worth 20K.

There are five hidden drop targets on the table. Hidden targets are not visible or functional until activated by the @-Ray Vision Target Bank. Each target is worth 100K points. Knocking down a Hidden Target puts it back into the queue of targets to reveal. All Hidden Targets are concealed again when a battle starts or the ball drains.

Sinks, Bumpers and Kickouts

@-CAVE SINK

HIDDEN SINK

SUBWAY SINKS

VILLAIN SINK

MYSTERY SINK

CAPITOL SINKS

UPTOWN SINK

LIGHTHOUSE SINK

SUBWAY BUMPERS

POWER KICKOUT

BE A HERO KICKOUT

The Platform Targets form a ring of drop and ricochet targets in the upper right corner of the table. Each ricochet target has a drop target in front of it. Each drop target is worth 25K. Each ricochet target is worth 5K. Knock down all the drop targets for 150K points. Targets reset at the start of the Quake battle.

The Subway bumpers are in the upper left of the table. For every three hits, one of the damaged buildings on the table is partly repaired. Subway Bumpers increase in value:

Base Value	1k points
2x	2k points
3x	3k points
4x	4k points
5x (max)	5K points

Captain Hero Ramps

DOWNTOWN RAMP

UPTOWN RAMP

WAREHOUSE RAMP

LIGHTHOUSE RAMP

CAPITOL RAMP AND EXTENSION

The Downtown Ramp runs from the middle of the table, around the Downtown cluster of buildings, and down to the right return lane. A trip through this ramp turns on the Downtown Combination Light and awards 30K points. The light times out after 10 seconds. If you can put the ball back up the ramp while the light is on you get 60K. Each additional time the ball goes up, the award is increased by 30K to a max of 300K.

The Uptown Ramp runs from the cluster of buildings in the center to the upper right corner buildings.

The Warehouse Ramp runs from the cluster of buildings in the center down to the left return lane.

The Lighthouse Ramp runs from the Downtown Diverter to the Lighthouse, and serves as an accessway from Downtown to the Lighthouse.

The @-Cave Sink is in the lower part of the table. Entering it awards 50K points. If the Extra Ball light is on, then it awards an Extra Ball and turns the Extra Ball light off.

The two Subway Sinks are in front of the lower bumpers, each blocked by a Subway Target. Each time your ball goes into a sink, you get 60K points and turn the respective flashing Subway Light to steady. If you enter both sinks, 125K is awarded, bumpers are incremented, and the Subway Targets are raised. The ball always exits from the Mystery Sink.

When you enter the Villain Sink, in the middle of the table below the upper right flipper, you begin a battle with a villain.

The Mystery Sink is on the middle edge of the table, right of the upper right flipper. If the Mystery Light is lit, you are given the Mystery Award. Otherwise, a multiplier is applied to the Super Jackpot Spinner points (first 2x, then 3x, then 4x to a cap of 5x). This is reset when the ball drains. The Mystery Light turns on during battles. The Mystery Sink serves as an exit for other sinks on the table.

MYSTERY AWARDS:

50K points

100K points

1 Million points

Repair All buildings

Maximize Bumpers

Extra Ball (available on last ball only)

The Capitol Ramp and Extension runs between the bumpers up into the Capitol Sink in the Capitol Building. The Extension Ramp runs from the Capitol Building to the Downtown cluster of buildings.

The Capitol Sinks are in the building at the end of the Capitol Ramp in the upper left corner of the table. The ball passes into one sink and out the other, awarding 50K points and turning the Capitol Ramp Light. This light times out in 10 seconds. If the ramp is hit before the light turns off, the award is incremented by 50K (to a maximum of 250K), and the Capitol Light is reset.

The Uptown Sink is in the upper right building at the end of the Uptown Ramp. You get 25K and turn on the extra ball light every time a ball goes through.

The Lighthouse Sink is in the buildings in the lower right of the table. You are awarded an easy 70K just for passing through. The ball comes out of the Mystery Sink.

Be a Hero at the end of the Uptown Alley. Here you perform the more mundane rescues and tasks that fill the slow points of any hero's day. There's plenty to do, as you'll discover. The first task is worth 30K points. Each additional task is adds 10K to the task value, capping at 150K. If you do all the tasks, the list begins again. This knockout resets with each new ball.

The Power Kickout is at the end of Dynamite Alley. Each time you enter the kickout, you are given 75K points and one of the following power-ups:

Strength

**Every hit on the bumpers now counts as three
Bumper caps show a clinched fist
Triples your score**

Speed

**Slingshot boost
Slingshot shows lightning bolts**

Flight

**Entrance of every ramp accelerates
Ramp art shows small wings**

**Each ability lasts 30 seconds, and is represented by a Power Light in the middle of the table.
Everything resets when the ball drains.**

Captain Hero Miscellaneous Stuff

SLINGSHOTS

DOWNTOWN DIVERTER

TURNSTILES

SPINNER

Slingshots are at the bottom of the table, one above each flipper. Each slingshot awards 750 points when hit.

The Downtown Diverter is in the center of the downtown building cluster. There is one entrance and three exits. The ball enters through the Capitol Ramp and leaves through the currently set exit ramp. Change the exit with the alley targets. Front left is to the Warehouse Ramp, back right is to the Uptown Ramp, and front right is to the Lighthouse Ramp. There are no points awarded and the ball does not change the diverter.

The Turnstiles are the three lanes above the bumpers. Each lane has its own turnstile light. Each time through turns on one light. When all the lights are on, the Table Multiplier is increased by one, to a maximum of 5. Each time through awards 3500 points.

The Spinner is in the Uptown Alley. It awards 750 points with each hit, and adds 25K to the Super Jackpot with each turn.

Captain Hero Lanes and Outlanes

LEFT OUTLANE

RIGHT OUTLANE

LEFT MIDDLE RETURN LANE

LEFT RETURN LANE

RIGHT RETURN LANE

UPTOWN ALLEY

The Left Outlane is the leftmost lane at the bottom of the table. Each ball going through awards 10K points and turns on an @ man Letter Light. Lit letters are rotated with flipper use. If all the letter lights are on, then they flash and you are awarded 50K points and one of the following, in this order:

First Force Field	green/yellow forcefield raised to block right outlane
Second Force Field	green/yellow forcefield raised to block left outlane
Power of Reflection	repels ball from the drain

The Right Outlane is the rightmost lane at the bottom of the table. Each ball going through awards 20K and turns on an @ man Letter Light. Lit letters are rotated with flipper use. If all the letter lights are on, then they flash and you are awarded 50K points and one of the following, in this order:

First Force Field	green/yellow forcefield raised to block right outlane
Second Force Field	green/yellow forcefield raised to block left outlane
Power of Reflection	repels ball from the drain

The Left Middle Return Lane is worth 10K points. Each time through turns on an @ man letter. Lit letters are rotated with flipper use. If all the letter lights are on, then they flash and you are awarded 50K points and one of the following, in this order:

First Force Field	green/yellow forcefield raised to block right outlane
Second Force Field	green/yellow forcefield raised to block left outlane
Power of Reflection	repels ball from the drain

The Left Return Lane is the innermost left lane at the bottom of the table. You get 5K points each time through. Each time through turns on an @ man letter. Lit letters are rotated with flipper use. If all the letter lights are on, then they flash and you are awarded 50K points and one of the following, in this order:

First Force Field	green/yellow forcefield raised to block right outlane
Second Force Field	green/yellow forcefield raised to block left outlane
Power of Reflection	repels ball from the drain

The Right Return Lane is the innermost right lane at the bottom of the table. You get 5K points each time through. Each time through turns on an @ man letter. Lit letters are rotated with flipper use. If all the letter lights are on, then they flash and you are awarded 50K points and one of the following, in this order:

First Force Field	green/yellow forcefield raised to block right outlane
Second Force Field	green/yellow forcefield raised to block left outlane
Power of Reflection	repels ball from the drain

Captain Hero Battles

When the ball is in the Villain Sink and there are no balls on the table, you are presented with the names of all the villains not yet combated. Use the left flipper to select a villain and the right flipper to accept a villain and begin the mode. Starting a battle awards 100K points. If the ball enters the Villain Sink during a battle, the time is reset. Only villains not yet battled can be selected, until all villains have been battled. Once all villains have been captured, the Evil Twin is the only one available and starts automatically.

Battle A: **Quake, The Earthquake Man**

Battle B: **The Mad Scientist**

Battle C: **Mystman**

Battle D: **Slimeman**

Battle E: **Mr. Pling, The Elastic Man**

Battle F: **Evil Twin**

The circular target bank in Uptown starts to rotate. Hit all rotating targets to win. Behind each rotating target, except for one, is a ricochet target. The exception contains a sink. If you hit the sink, the Earthquake Man is defeated. You can also defeat Earthquake Man by hitting all 9 rotating drop targets.

If you hit a ricochet target, the ball becomes copper until it collides with another component. If this component is a building zone, then the building is reduced to the next stage of destruction. Otherwise points are scored normally. The ball then reverts to its normal color and causes no more damage. This battle lasts 60 seconds. Points are awarded as follows:

Each drop target	75K points
Each ricochet target	25K points
Sink	250K points
Defeat Quake	Jackpot

18 drop targets pop up in the main playfield to represent the Mad Scientist's henchmen. You must knock them all down, then put the ball in the Villain Sink where the Mad Scientist is. When you hit a henchman target, your ball changes to an "unhappy face". If the ball hits a building zone, that building is reduced to the next state of destruction. Otherwise points are scored as normal. After the ball hits anything, it turns back to its normal color. This battle lasts 60 seconds, and awards the following points:

Each henchman target	50K points
Defeating the Mad Scientist	Jackpot

Slimeman throws parts of himself onto the table and makes slime spots. If your ball collides with a spot, it turns green and becomes stuck, and a new ball is launched. Slimed balls are released by sending a ball up the Capitol Ramp. The slimed balls remain green until they collide with a component. If the component is a building, that building is reduced to the next stage of destruction. Otherwise points are scored as normal. That particular ball then becomes normal. To capture Slimeman himself, hit the bumper he's standing on 8 times. The battle lasts 60 seconds. At the end of the battle, any balls which are still stuck in slime melt into the table and are gone. Score points as follows:

Bumper	25K points
Defeat Slimeman	Jackpot

Elastic Man rolls out of the Capitol Building as a colored ball, stops at the base of the Capitol Ramp and takes his "normal" form. His arms stretch out to grab the wall left of the Subway Chute and the side of the Downtown Ramp. His body is a spot target which blocks access to the Capitol Ramp, and his arms are slingshots for the duration of the battle. When your ball hits one of these slingshots, the ball changes color to purple until it collides with a component. If the component is a building zone, then the building is reduced to the next stage of destruction. Hitting anything else gets you normal scoring. The ball then reverts to normal.

Mr. Pling is defeated by hitting the spot target of his torso 8 times. This battle lasts 60 seconds and awards the following points:

Each time the torso is hit	50K points
Defeating Mr. Pling	Jackpot

The Evil Twin sits in the center of the table on the Downtown Diverter. He uses six special magnets to control ball movement. If your ball lands on one of his magnets, it becomes a sickly green and is thrown from the magnet. It stays sickly green until it collides with another component. If this component is a building zone, then the building is reduced to rubble immediately. Otherwise points are awarded as normal. The ball then reverts to normal and does no more damage.

Each time you hit a Dynamite Target, a magnet turns off. When all the Dynamite Targets have been knocked down, a ball in the Power Kickout turns off the rest of the magnets. When all the magnets are deactivated, the Evil Twin requires 3 shots into the Downtown Ramp to be vanquished. Points awarded:

Starting battle	500K
Landing on a magnet	50K each
Turning off a magnet	200K each
Defeating Evil Twin	Jackpot

Mystman sits on a bumper that blinks in and out of 5 different pre-set locations. You must hit the bumper 6 times to defeat Mystman, who spends no more than five seconds in any location.

Each time a bumper is hit, Mystman fires a mist colored ball. If this ball hits a building zone, that building is reduced to the next stage of destruction. If it hits something else, points are scored normally. The ball then reverts to normal. This battle lasts 60 seconds. Each bumper hit is worth 10K points more than the previous bumper hit (starting at 10K). Final defeat awards the Jackpot.

Menus

All three games of Full Tilt! 2 use the same menus with the same options.

GAME

NEW GAME

LAUNCH BALL

PAUSE/RESUME GAME

HIGH SCORES

DEMO

EXIT

OPTIONS

FULL SCREEN

SELECT PLAYERS

SOUNDS

MUSIC

SOUND QUALITY LEVEL

CD AUDIO

PLAYER CONTROLS

TABLE RESOLUTION

BALL REFLECTIONS

BALL SPIN

FLOATING TEXT

BRIGHTNESS

Starts a New Game, no matter what you were doing.

Sends a ball into the field of play, just like using the plunger.

A toggle switch to halt the action for a short moment to study the board, or for a long while to read a book.

Provides grist for official bragging rights.

Lets you watch the computer play against itself so you can see what you should be doing.

Ends the game, shuts down the table, packs everything away and lets you get back to work.

Toggles between Full Screen and a Window.

Lets you select up to four players. You can even be all four if you want.

Toggles the sounds on and off. Performance can improve with the sound off.

Toggles the game music on and off.

Lets you increase (or decrease) the quality of game sounds and music.

When CD Audio is turned on, the music from your game will play from the CD. The sound quality of the music will be higher, but performance of the game may suffer a bit.

Opens a box so you can assign any key you want to the flippers, plunger and table nudges. You can also enable joysticks and certain mouse controls from this box.

Allows you to increase or decrease the resolution of your game table.

Make your ball realistically shiny. Turn the reflections off for better performance, if necessary.

Increase the realism of ball action on the table with this toggle switch.

Turn it on for a running score, or turn it off for less distraction.

This allows you to set the brightness of your table.

Tips for Great Scores

Beginners (or anyone else) can have a lot of fun just hitting the ball whenever it comes near a flipper. But the idea of playing pinball is to get the highest score possible, and there are lots of things you can do to improve scores.

Here are some tips from the experts:

General

Controlling the Ball

Aiming the Ball

Nudging the Table

Multi-Ball Hints

General

Many people believe that pinball is a game of luck. Although there are very few instances in life where luck *doesn't* play some role, in modern games the luck factor is much lower. The consensus among players today is that luck only comprises 20-25% of pinball playing.

There are three main ways to improve your play.

Have patience. It's tempting to flip every time the ball approaches the flippers, but you stand a much better chance of hitting the shot you *want* to hit if you have the patience to slow the ball down as much as you can and shoot a controlled shot.

Aiming is largely intuition and "feel" at first, but eventually you will learn to visualize your target on the flipper to make the ball go where you want it to go.

Nudging the table is an art, or at least a skill. Pinball is a physical game, and a major portion of its attraction is the way you can have a direct influence on the environment--something not usually possible in a video game, but we allowed for it in Full Tilt! 2.

Controlling the Ball

The simplest way to catch a ball is to merely hold up a flipper when the ball is heading toward it and hope it comes to rest in the "V" at the pivot point of the flipper. This is a decent starting point, but most of the time it is not sufficient to totally stop the ball. Here are a few more advanced ball control techniques:

The Dead Catch

The Live Catch

The Flipper Pass

The Bounce Pass

This is one of the easiest catches to perform. Hold up a flipper when the ball is heading toward it. *Just* as the ball gets to the flipper, let the flipper go. This should cause the ball to temporarily lose all of its momentum. Even though the flipper is now lowered, so the ball will start to roll, with a very slow moving ball you're in a better position to make a controlled shot. This is also known as the "Drop Catch".

This could be the most valuable skill you can have. When a ball is rolling toward a flipper, time your flip so that it meets the ball at the top of the flipper's up position. If done right, the ball will lose momentum and gracefully roll down the raised flipper to a caught position. Even if you just come close, the ball might slow enough to make another live catch, or other kind of catch, much easier.

Did you catch the ball on one flipper, but the shot you want is made from the other flipper? No problem. You can get the ball to the other side by doing a quick flip: drop the flipper, raise it again right away, and hold it up. If your timing is right, this should send the ball gently up and over to the other flipper, where it can be easily caught. Of course, until you get the timing right, you'll shoot a few balls off in random directions or worse, lose them down the center drain. Better practice this one.

Sometimes the best catch is no catch at all: when the ball approaches a flipper, just let it hit--don't touch the flipper button--and, depending on the angle, it may bounce over to the other flipper, slowed down and ready for an easy catch. You'll learn which angles work through practice.

Aiming the Ball

Aiming is hard to teach and takes lots of practice. The best hint is to try to look at both ends of your shot. Visualize a line from where the ball is (or will be when you hit it) to your intended target. Once you are able to hit your target on a regular basis, it then all you need to do is concentrate on the lower portion of the playfield, since you should have a good idea of where on the flipper the ball needs to be when you flip it, and where it will go afterwards. You'll also lose fewer balls down the drains. This is especially important during multiball, when most of the activity is going on down around your flippers and you'll need to make many quick shots, without the luxury of watching where each ball goes.

Basic Controls

Full Tilt! 2 is controlled with a few of the keys on the keyboard. Here are the default keys:

Space Bar -- Hold it to pull out the plunger, release it to shoot the ball

Z -- Activate left flipper (or flippers)

/ -- Activate right flipper (or flippers)

X -- Bump table to the right

. -- Bump table to the left

Up-Arrow -- Bump table up

Alt -- Toggles the Menu bar on and off while in Full Screen Mode

You can change these keys to suit your playing style by selecting **Player Controls** in the Options menu.

Here are some additional useful keyboard shortcuts:

F1 -- Opens the electronic documentation/Help to the contents page

F2 -- Starts a new game

F3 -- Pauses/Unpauses the game

F4 -- Toggles between Full Screen and Window mode

F8 -- Opens Player Controls

Ctrl+T -- Lets you select a table

Ctrl+S -- Toggles Sounds on and off

Ctrl+M -- Toggles Music on and off

In addition, you can use the left and right mouse buttons to activate the left and right flippers.

Credits

The Maxis South Team

Executive Producer

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Technical Director

Mike Sandige

Producer

Lisa Acton

Programming

Todd Hartmann

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QA Lead

Darin Henley

Quality Assurance

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Lead 3D Artist

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Phil Shenk

Paul Effinger

Additional Art

Doug Watson

Design

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Voices

Ev Lunning

Martha Merriell

Bill Johnson

Sound Production

Music & Sound Effects

Ridgeway Sound/Matt Ridgeway

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Scott Shicoff	Zir-Paul Macaraeg
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Install Program

Anthony Hobbs

Documentation and Help File

Bob Sombrio

Special Thanks

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Ashley Csicsery
Felicia Csicsery
Tom Forge

Nudging the Table

Never be afraid to give the game a good shake every now and again. Beginners may see people hitting, banging and shaking tables, and think that the player is cheating. Far from it: pinball tables are designed to be nudged--up to a certain point, of course.

Nudging is probably the second most important aspect of pinball, next to flipping. It is a true art, to be mastered through practice. Nudging is only helpful if you do it right--nudge too hard and the game will tilt. You should strive to get the maximum effect from the least amount of movement.

The penalty for tilting is having your flippers go dead and forfeiting your bonus. On some games, the bonus is worth quite a few points, on others it is almost worthless. Keep track of your bonus and take it into account when you decide whether to try saving a ball with a nudge. If the bonus is low, go for it. You've got nothing to lose.

One of the most common forms of nudging is the slap-save. When a ball looks as if it is heading straight down the middle, you can slap the flipper closest to the ball. This will hopefully be enough force to move the table under the ball so that the flipper touches part of the ball, to either get it back into play or over to the other flipper (where you can flip it back into play or slap that side as well). Slapping first one side then right away the other side can save more balls than you think.

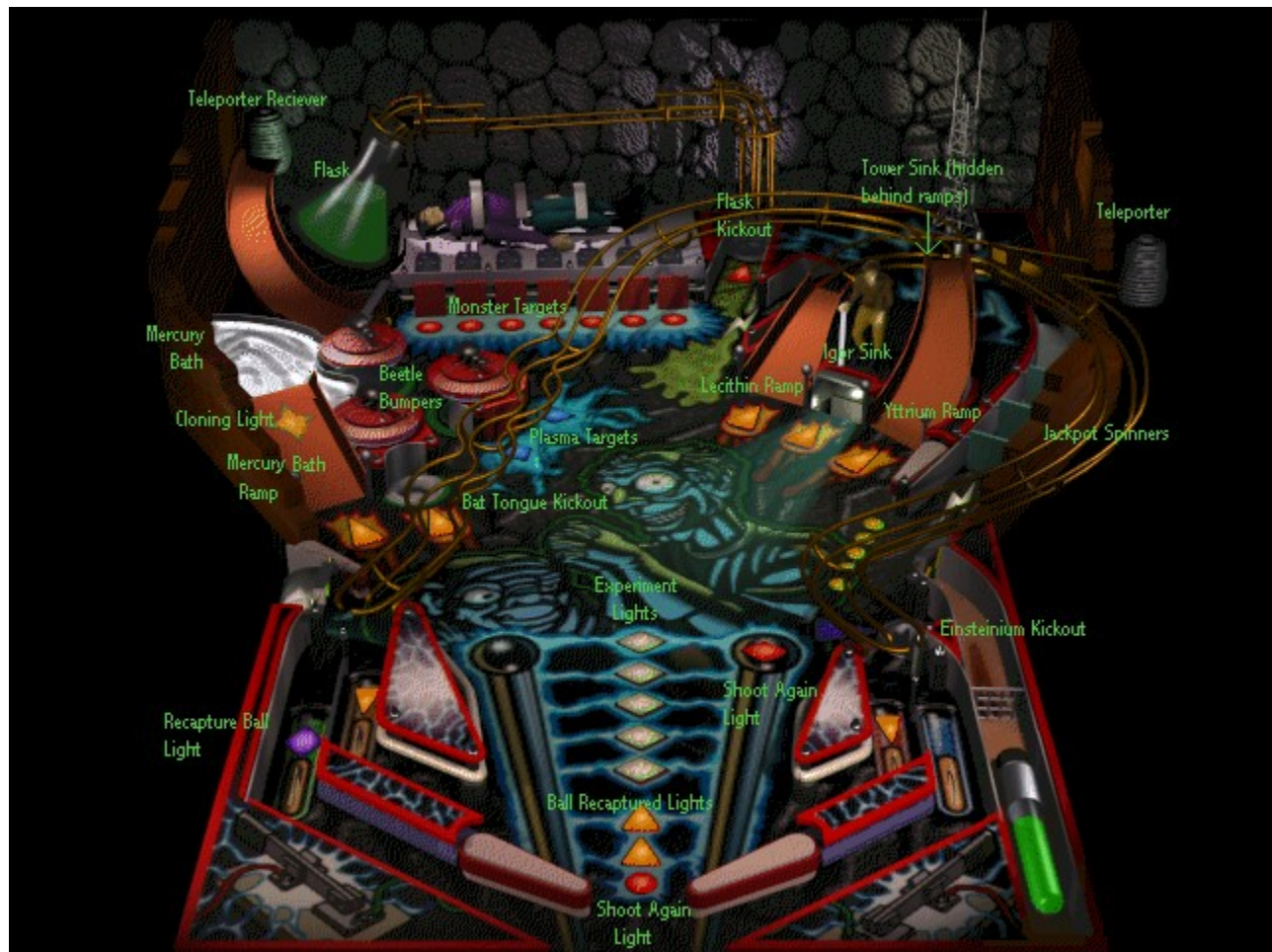
In Full Tilt! 2, the default keyboard equivalent of the slap-save is hitting "/" and "." (right flipper and bump table to the left) or "Z" and "X" (left flipper and bump table to the right) at the same time. If you change the default keyboard controls for these functions, try to keep the flipper and bump keys close to each other for easier slap-saves.

Here's another effective trick: when a ball is near an outlane, nudge the ball against the outside edge of the playfield to get it out of the area instead of trying to nudge it towards the center of the table. You'll get better results.

The Hidden Sink is accessed as a skill shot only.

Uptown Alley is the path with the spinner just right of the Downtown Ramp. It leads to the Be A Hero Kickout.

Mad Scientist Table



The Alien Daze Table



Captain Hero Table



Multi-Ball Hints

Multiball is an entirely different story. Sometimes you will be able to employ the tactics described elsewhere, but usually the action will be too frenetic to play a very controlled game.

The best plan of action in multiball is to keep the number of balls flying around down to a minimum. Some playfields will have places you can shoot the ball to get it out of the way for a while. Other times, the only way to reduce the number of balls is to hold one (or more) on one flipper while you do your best to play with only the other flipper. This isn't always practical, but you can mix it up a little bit. For example, you may need to shoot a shot on the left then a shot on the right. Depending on how the shots are laid out, you may be able to make one shot, wait for the ball to return to the flippers to control it again, then shoot the other ball.

If at all possible, you should try to keep at least one ball caught at all times. Nothing is more maddening than losing all of your balls at once. When another ball is heading towards the caught ball, just keep your cool and see what happens. Either one of the balls will bounce nicely to the other flipper, both balls will wind up on the same flipper, or in rare circumstances both balls will wind up going out of control.

When more than one ball is caught on a single flipper, you eventually will have to separate them. Usually a quick flip (as in a flipper pass) will be sufficient to get one ball

off the flipper. The main objective is to separate the balls, but you also want to try to keep one ball in a caught position.

The only time you should sacrifice a caught ball is if you are about to drain your next-to-last ball. Sometimes being able to flip at the right time will be enough to save the drain-bound ball, but if that is not going to do it, then you will need to try a pool-shot: try to aim the ball you have caught at the draining ball to change its course. This may have the side-effect of draining one (or possibly both) of the balls, but at least you tried!

A Brief History of Pinball

So Why Is It Called Pinball?

The ancestors of the modern pinball game were much like Pachinko machines. They were not upright like Pachinko machines, but they did have many pins and holes in the playfield. Balls came down from the top and scored a varying amount of points depending on which hole they eventually fell into. This is probably how the term *pin-ball* came about.

The Early Years

The coin-operated industry began in 1931 with the production of *Ballyhoo*. It was built by Raymond Maloney, who later founded the Bally Manufacturing Company. It was not until 1936, however, until the term "pinball" was coined.

In 1934, the infamous tilt mechanism was devised. People realized they could manipulate the game to their advantage by shaking it, so manufacturers had to come up with a way to stop the cheating. Supposedly, one of the ideas that did *not* make it into production was pounding sharp pins or nails onto the side and bottom of the machine (this was quickly rejected on the assumption that players would get so mad, they'd *really* inflict some damage on the machine). One of the earliest implementations involved a ball on a pedestal that would fall off when the machine was moved around too much. On modern machines, there are two tilt sensors: the standard movement tilt and the slam tilt. Slam tilts are used to detect major abuse (such as slamming your hand into the front of the coin door or dropping the machine) and are just a couple of leaf switches that signal a slam when they touch each other. The movement tilt is detected by a pendulum and bob mechanism that moves around inside a ring. A tilt (or tilt warning) occurs when the metal pendulum rod touches the metal ring.

1947 was the big year. *Humpty Dumpty*--the first game with flippers--was released by Gottlieb. The flippers were not set up as we know them today, however. There were three sets of two flippers located at three different spots going up the playfield. They were facing each other, as flippers do today, but the pivot point was at the *bottom* of the flippers. In January 1948, a company called Genco placed the flippers at the bottom of the playfield in their game *Triple Action*. The configuration was still a little unusual: the flippers were facing outward, not inward. The first game that had the flippers set up as we know and love them today was probably *Spot Bowler*, a 1950 Gottlieb game.

If you have not seen one of these older games, you may be surprised at the size of their flippers. They were probably about the size of 2 pinballs in length, much like some of the small flippers used in today's games (such as the leftside flipper on *The Addams Family*). It was not until 1970 that games started using the longer flippers on a regular basis.

One of the darkest moments in pinball history came about on January 21, 1942. Pinball was banned in New York City because it was viewed as a game of luck rather than a game of skill (ergo, playing pinball is gambling!). To "celebrate" the ban, Mayor Fiorello Henry LaGuardia (as in LaGuardia airport) smashed a number of machines in front of a largely supportive crowd. The ban lasted until 1976. Free games (replays, matches, etc.) continue to be illegal in New York City to this day, although the law goes unenforced.

In 1960, the idea of an earnable extra ball first appeared in Gottlieb's *Flipper*. This was done in response to the laws of many areas that made it illegal to award replays.

The first drop targets were introduced in Williams' *Vagabond* in 1962.

Modern Pinball

The next major change came along in 1975. The first non-relay-based game, called *Spirit of 76*, was produced by Micro. It marked the beginning of the switch from electromechanical to solid state games. The first widely available solid state game (only 100 *Spirit of 76*s were made, mostly due to an unattractive playfield) was *Freedom* from Bally in 1976. Many games in the 1976 to 1979 period were made in two versions (both solid state and electromechanical) as manufacturers refined the process of moving to the new technology.

In 1979, the first talking game was produced: *Gorgar*, from Williams. In the early 1980s, many games started using magnets to let the player try to save the ball (called *magna-save* by Williams). *Black Knight* and *Jungle Lord* are two good examples of this.

The next major revolution in pinball was not until 1991, when Data East came out with the first dot-matrix display in their game *Checkpoint*. Starting around 1992, all games from all manufacturers have employed a dot-matrix display.

So where are we today? Pinball has come a long way in the last six years or so, particularly in complexity. And it will no doubt continue to advance with the technology. One important advent in pinball history is the introduction of pinball simulations on home computers. Now that the average home PC has good quality graphics and sound, plus high resolution graphics and a lot of processing power, games like Full Tilt! 2 are possible.

Even the makers of computerized virtual pinball tables don't expect--or want--them to totally replace the stand-alone "real" tables. There's nothing like standing at a full-size table and getting physical. But virtual tables like Full Tilt 2 are great games, with the potential to create tables that can't even be built in the real world--simultaneous multiplayer wonders, multilevel mazes and more. Besides, at \$5,000 to \$15,000 a table for a new pinball game, these electronic ones are really worth their weight in gold.

In summary, pinball is a great game with a glorious history. And as far as the future goes, who knows what surprises are in store for us?

