Jackpots

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Recap

	Reel 1	Reel 2	Reel 3
7's	1	1	1
BAR	4	3	2
CHERRY	5	6	7
Total	10	10	10

Combo	Prize
3 7's	250
3 BAR	20
3 CHERRY	1

Hits: 3x7's = 1 x 1 x 1 = 1
3xBAR = 4 x 3 x 2 = 24
3xCHERRY = 5 x 6 x 7 = 210

Cycle: 10 x 10 x 10 = 1000

Hit Rate: Any Win = 1000 / (1 + 24 + 210) = 4.25
3x7's = 1000 / 1 = 1000
3xBAR = 1000 / 24 = 41.6
3xCHERRY = 1000 / 210 = 4.8

RTP: $$\frac{250 \times 1 + 20 \times 24 + 1 \times 210}{1000} = 94\%$$

What is a Jackpot?

"A progressive jackpot is an incremental prize that increases by the accumulation of contributions from the turnover of the specified game"

— *Australian/New Zealand Gaming Machine National Standard 2022*

Translated to human: A prize which increases in value after every bet.

What is a Jackpot?

It has 2 components:

1. Start up value

2. Increment

(% of turnover added to the pool)

It has an **Average Prize** which is the average amount of increment added to the start up when it awards.

Example


DRAGON CASH™
GRAND JACKPOT
$5,632.15
GRAND JACKPOT
MAJOR JACKPOT
$649.72
MAJOR JACKPOT
MINOR BONUS
$1,250
PLAY $1
$250
MINI BONUS
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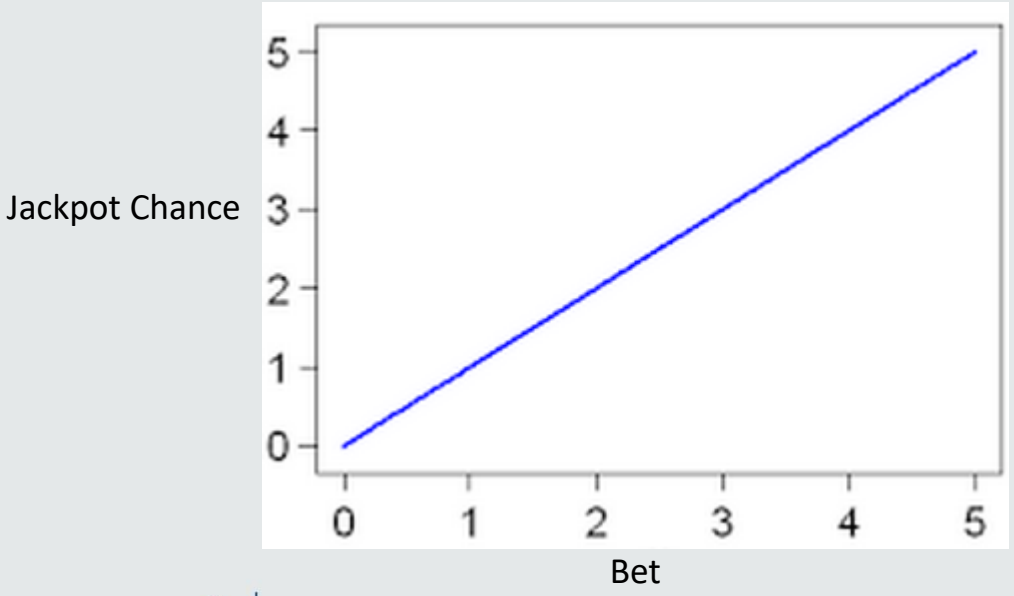
The fun jackpot fact

Probability of triggering Jackpots is directly and linearly proportional to the amount bet.



Example:

If I was betting 1c, I would have a 1 in 100,000,000 chance of winning the GRAND jackpot.

If I was betting 10c, I would have a 1 in 10,000,000 chance.

If I was betting $1.00 I would have a 1 in 1,000,000 chance

If I was betting $2.00 I would have a 1 in 500,000 chance

The fun jackpot fact

$1 Wager

5x King pays $15

Odds of 5x King are 1 in 5000

Cost to win = 5000 x $1 = $5000

RTP = $15 / $5000 = 0.3%

GRAND jackpot pays $500

Odds of GRAND are 1 in 5000

Cost to win = 5000 x $1 = $5000

RTP = $500 / $5000 = 10%

$2 Wager

5x King pays $30

Odds of 5x King are 1 in 5000

Cost to win = 5000 x $2 = $10,000

RTP = $30 / $10,000 = 0.3%

GRAND jackpot pays $500

Odds of GRAND are 1 in 2500

Cost to win = 2500 x $2 = $5000

RTP = $500 / $5000 = 10%

Prize can't double and RTP MUST remain the same. Therefore we must change odds

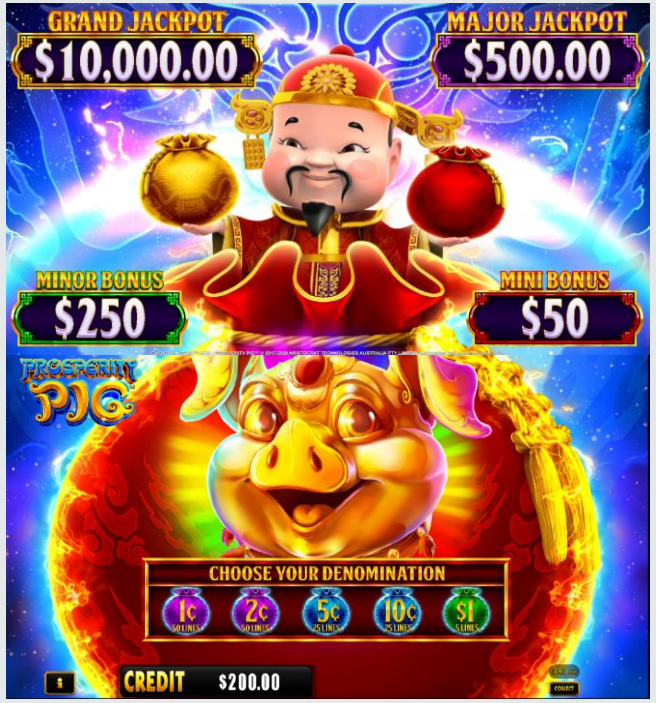
Types of Jackpot

Stand Alone Progressive (SAP)

Individual Machine Jackpot

Linked Progressive (LP or Link)

Multiple machines, same jackpot



What can be in a machine

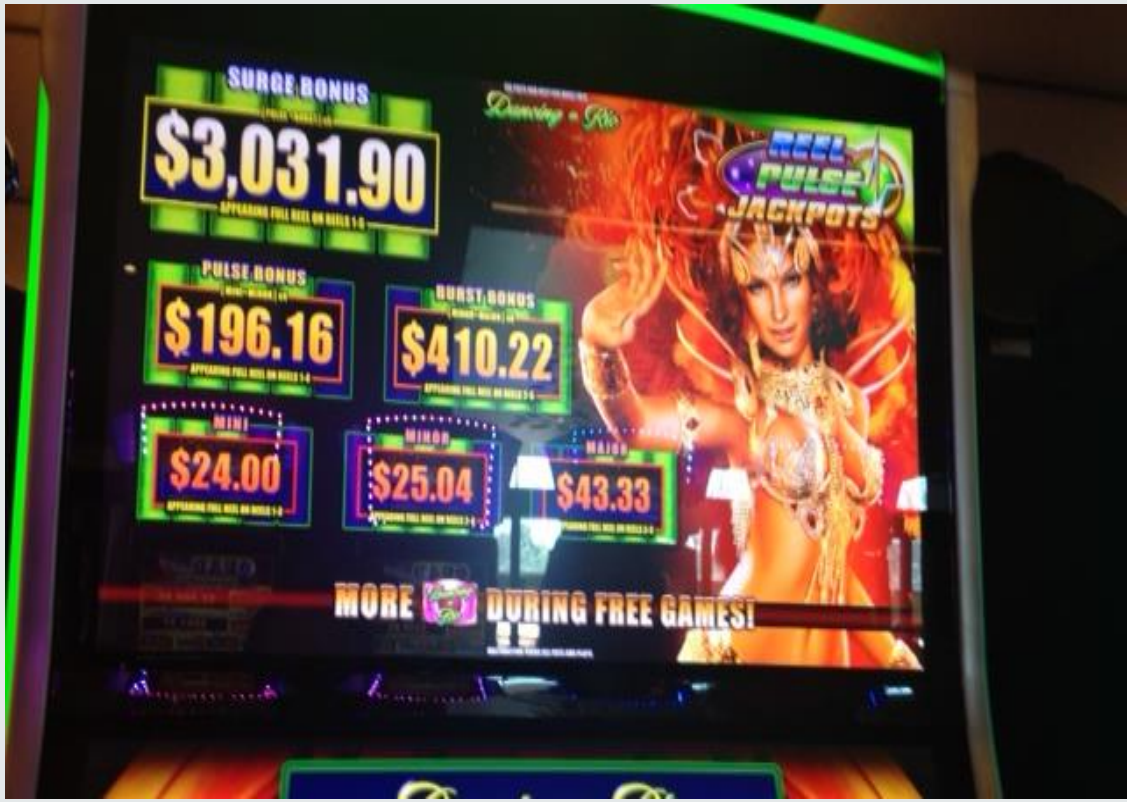
- Multiple Linked Jackpots
- Multiple SAP Jackpots
- Linked and SAP Jackpots
- Multiple Linked and SAP jackpots
- Bonuses
- Multiple Linked Jackpots, Multiple SAP Jackpots, Multiple Bonuses

Examples

- GRAND is Linked
- MAJOR is SAP
- MINOR and MINI are Bonus Prizes

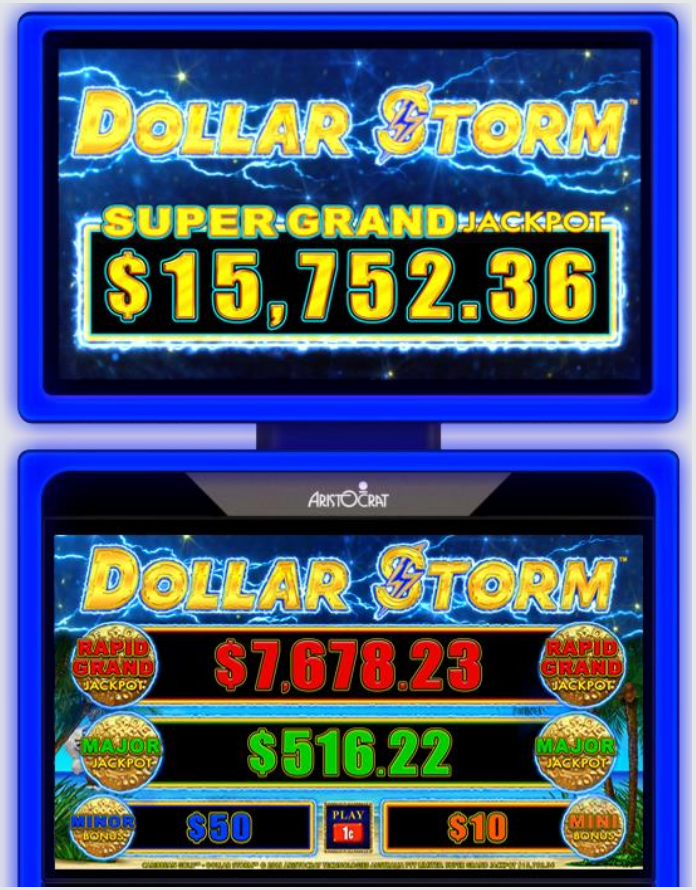
Examples

- Top 3 levels are BONUS prizes
- Bottom 3 levels are SAP



Examples

- SUPER GRAND and RAPID GRAND can be Linked or SAP
- MAJOR is a SAP
- MINOR and MINI are Bonus Prizes



Types of Jackpot

SAPs and Links are also triggered differently.

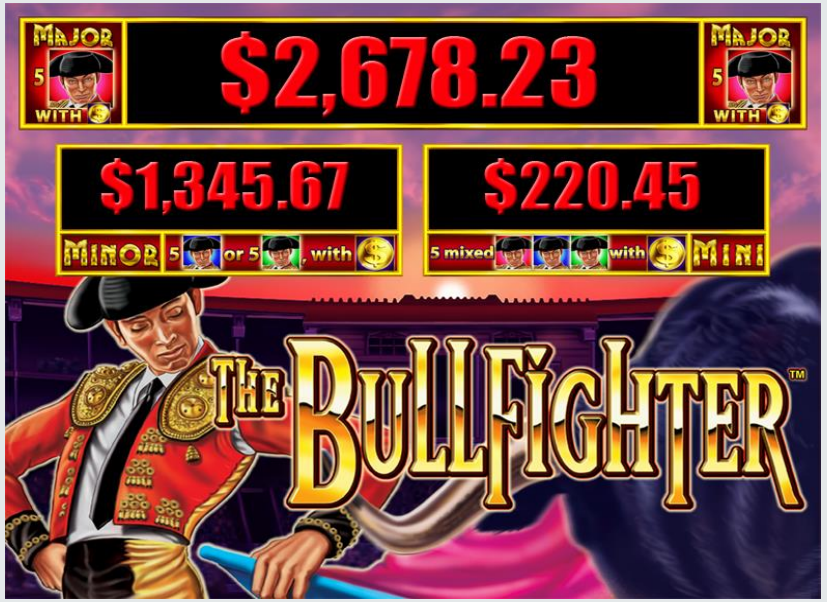
Examples:

- Symbol Driven
- Deterministic/Mystery
- Random
- Hyperlinks

Types of Jackpot

Symbol Driven

A symbol driven jackpot is triggered through a combination on the reel strips. The probability of winning the jackpot equals the probability of hitting the specific combination.



Example 1 – Symbol Triggered

What's the Jackpot RTP and Avg. Prize?

$1 Game

22 Symbols on each reel strip

Reel 1 : 4 x Red 7s

Reel 2: 4 x Red 7s

Reel 3: 4 X Red 7s

3 x Red 7s wins Grand Jackpot

Grand Jackpot start up = $25

Increment = 2%

Example 1 – Symbol Triggered

What's the Jackpot RTP and Avg. Prize?

Game Cycle:	22 x 22 x 22 = 10,648 ($10,648)
3 x Red 7 Hits:	4 x 4 x 4 = 64 (per cycle on ave.)
3 x Red 7 Hit rate:	10,648 ÷ 64 ≈ 166.38 spins
Jackpot amount given away per cycle (on average):	64 x $25 = $1600
Jackpot start up %:	= $1600 ÷ $10648 = 15.03%

Game Rules

$1 Game

3 x RED 7's wins Grand Jackpot, 4 RED 7's on each reel

Reels are all 22 symbols long

Grand Jackpot Start Up = $25

Increment = 2%

Jackpot Hit Rate: 166.38 games

Startup(%) = 15.03%

Example 1 – Symbol Triggered

What's the Jackpot RTP and Avg. Prize?

Jackpot RTP:

Start up	15.03%
Increment	2.00%
Jackpot RTP	17.03%

Game Rules

$1 Game

3 x RED 7's wins Grand Jackpot, 4 RED 7's on each reel

Reels are all 22 symbols long

Grand Jackpot Start Up = $25

Increment = 2%

Jackpot Hit Rate: 166.38 games

Startup(%) = 15.03%

Example 1 – Symbol Triggered

What's the Jackpot RTP and Avg. Prize?

Increment (T/o contribution): 2%

Jackpot hit rate: ≈ $166.38

Average increment before awarded =

$166.38 x 2% = $3.33

Average increment: $3.33 per Jpot.

Jackpot increment % is a design or venue choice

Game Rules

$1 Game

3 x RED 7's wins Grand Jackpot, 4 RED 7's on each reel

Reels are all 22 symbols long

Grand Jackpot Start Up = $25

Increment = 2%

Jackpot Hit Rate: 166.38 games

Startup(%) = 15.03%

Jackpot RTP = 17.03%

Average Increment: $3.33

Example 1 – Symbol Triggered

What's the Jackpot RTP and Avg. Prize?

Average Prize:

Start up amount	$25.00
Average increment	$ 3.33
Average Prize	$28.33

Game Rules

$1 Game

3 x RED 7's wins Grand Jackpot, 4 RED 7's on each reel

Reels are all 22 symbols long

Grand Jackpot Start Up = $25

Increment = 2%

Jackpot Hit Rate: 166.38 games

Startup(%) = 15.03%

Jackpot RTP = 17.03%

Average Increment: $3.33

Example 2 – Symbol Triggered

What's the Jackpot RTP and Avg. Prize?

$1 Game, 5 Reels

5 x RED 7s wins Grand Jackpot

Grand Jackpot Start Up = $500.00

Increment = 0.1%

	Reel 1	Reel 2	Reel 3	Reel 4	Reel 5
RED 7s	2	2	1	4	1
Other Symbols	18	18	19	16	19
TOTAL	20	20	20	20	20

Steps:

1. Work out cycle and number of jackpot hits
2. Calculate Startup %
3. Find Jackpot Hit Rate
4. Calculate Increment in $
5. Find total Jackpot RTP and Average Prize

Example 2 – Symbol Triggered

What's the Jackpot RTP and Avg. Prize?

Cycle = 20 x 20 x 20 x 20 x 20 = 3,200,000 games

5 RED 7s = 2 x 2 x 1 x 4 x 1 = 16 Hits

Startup amount given away per game cycle: $16 \times \$5000 = \$80{,}000$

Startup % = $\frac{\$80{,}000}{\$3{,}200{,}000} = 2.5\%$

Jackpot hit rate: $\frac{3{,}200{,}000}{16} = 200{,}000$ games ($200,000)

Increment($) = $200,000 x 0.1% = $200

Total Jackpot RTP = 2.5% (Startup) + 0.1% (Increment) = 2.6%

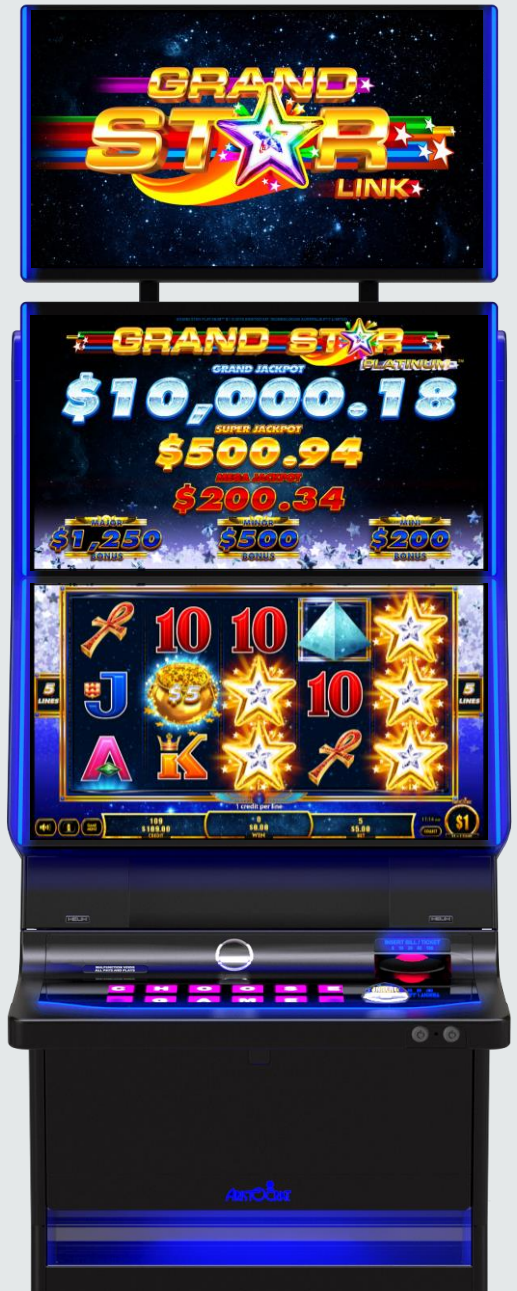
Average Prize = $5,000 (Startup) + $200 (Increment) = $5,200

Steps:

1. Work out cycle and number of jackpot hits
2. Calculate Startup %
3. Find Jackpot Hit Rate
4. Calculate Increment in $
5. Find Total Jackpot RTP and Average Prize

Symbol Triggered Summary

- By far the most popular type of jackpot mechanic for players
- Calculation varies wildly depending on the mechanic
- Lots of innovation in this space



Mystery Jackpots

- Jackpot starts up at a fixed value
- Increments with each bet until it goes over some hidden value, then awards and resets
- “Must hit by $XXXX.xx” or similar is the giveaway
- Typical installed in most medium-large clubs in NSW

Mystery Jackpots - Example

- Say you manage a gaming floor with 50 machines and the average RTP of a machine is 89%.
- You want to install a $1,000 house mystery link worth an additional 2% RTP that has a maximum value of $5,000
- Average machine turnover is $2,500 so how often does it hit? And what's the average prize?

Mystery Jackpots - Example

- Startup = $1000
- Maximum Value = $5000
- RTP = 2%

- Average Jackpot = $\frac{\$1{,}000+\$5{,}000}{2} = \$3{,}000$
- Jackpot Hit Rate = $\frac{Average\ Jackpot(\$)}{Jackpot(\%)} = \frac{\$3{,}000}{2\%} = \$150{,}000$
- Jackpot Hit Rate (days) = $\frac{\$150{,}000}{\$2{,}500} = 60$ Days

Random Jackpots

A Random Jackpot is triggered through a random number generator. The Probability of winning is proportional to your bet.

Example: RNG pulls a number between 1 and 100,000,000

If you are betting $1.00 - if the RNG selects a number between 1-100 you are awarded the jackpot

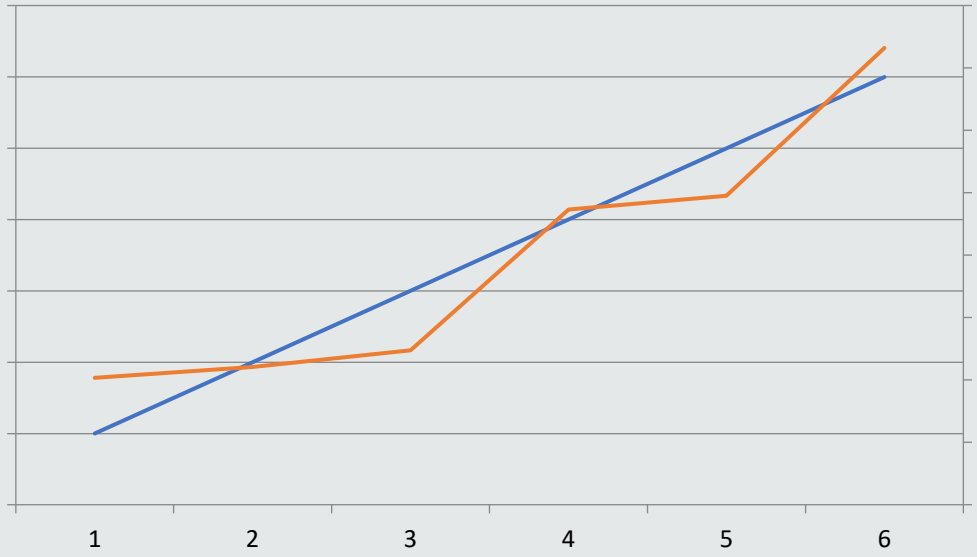
If you are betting $2.00 - if the RNG selects a number between 1-200 you are awarded the jackpot

Typically awarded by a banner just popping up on screen

Random Jackpots

Despite looking bland, they are very useful and often used to balance symbol driven jackpots.

Orange = JP Chance
Blue = Bet



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Despite looking bland, they are very useful and often used to balance symbol driven jackpots.

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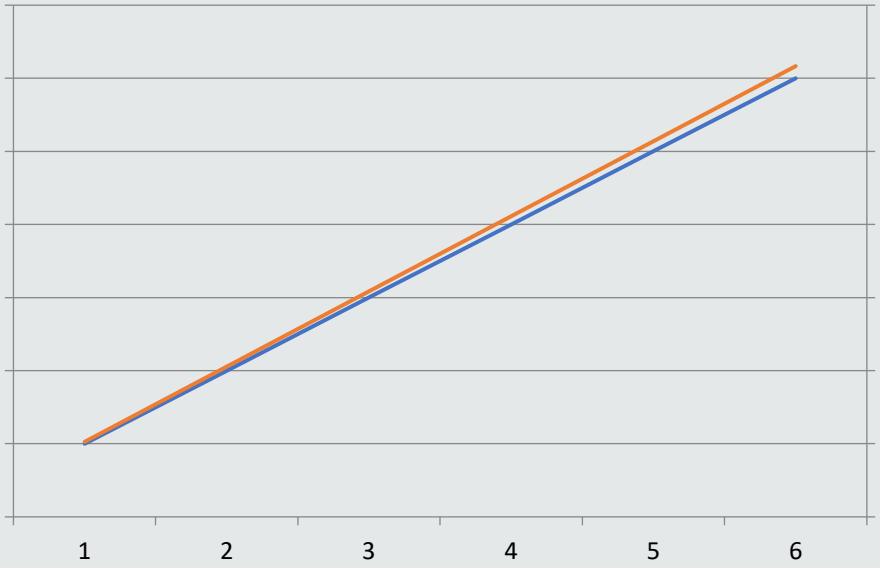


Hyperlinks

Hyperlinks

Player Starts Game

RNG in the gaming machine Selects a number
within a prescribed range of numbers
(The Feature Hit Rate in Cents)

HIT RATE = $125.00
(12,500 cents)
RANGE = 1 - 12,500

This number
IS COMPARED AGAINST THE SIZE OF THE BET

BET = $1.00
(100 cents)
NUMBERS = 1 - 100

If NO

IS THERE A
MATCH BETWEEN THE BET AND THE NUMBER
SELECTED BY THE RNG?

Is BET <= RANDOM NUMBER?

If YES

TRIGGER JACKPOT FEATURE

WHICH JACKPOT LEVEL WAS WON?

JACKPOT CONTROLLER SIGNALLED

Types of Jackpot

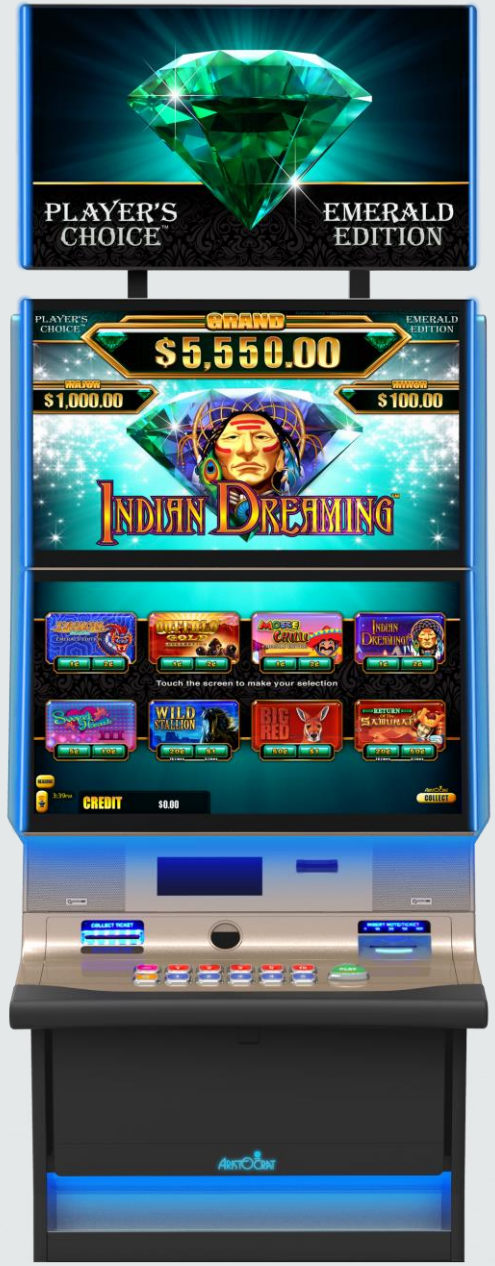
SAPs and Links are also triggered differently.

Examples:

- Symbol Driven ✓
- Deterministic/Mystery ✓
- Random ✓
- Hyperlinks ✓

Bonus Jackpot Type – Bolt Ons

- Bolt On jackpots are jackpots attached to games that didn’t traditionally have one (5 Dragons, More Chilli etc)
- Lets the player enjoy their favourite games but now with the chance at a big jackpot
- Jackpot Winning mechanic isn’t typically tied to any game feature and sits independent ie “bolted on” to the game



Bonus Jackpot Type – Bolt Ons

- Example
- Startup = $5,000
- Hit Rate = $500,000
- Increment = 0.25%
- Startup RTP = $\frac{\$5{,}000}{\$500{,}000} = 1\%$
- **Total RTP** = 1.25%

Game	Game RTP	Total RTP (inc. prog)
Where's the Gold	88.00%	89.25%
5 Dragons	87.50%	88.75%
Big Red	90.50%	91.75%

What else is out there?

- Wide Area Progressives
- Fraternal Progressives
- Community Progressives

Jackpot Ceilings

QLD – *A Jackpot should award at the ceiling no more than 1 in 20 times and no less than 1 in 100 times.*

What happens when it does reach the ceiling?

Extra turnover generates extra increment, this is added to a hidden meter called the overflow meter.

When the jackpot is eventually won, the overflow meter is added to the start up of the next jackpot.

Jackpot Ceilings

Ex: Jackpot is at the ceiling of $8,888.

There's currently $550 on the overflow meter.

A player wins the GRAND and is awarded the $8,888.

The jackpot resets to $5,000 and the $550 from the overflow is transferred to give a new start up of $5,550.

Jackpot Frequency

Because of the rare nature of jackpots hitting what are the odds of one going off multiple times in a short period of time?

Here's what we analyse when this happens:

- Look at the total turnover and the number of hits recorded
- Look at the theoretical math and compare the chance of that many hits

Jackpot Hits for $1,500,000 HR		Jackpot Hits					
		0	1	2	3	4	5
Turnover($)	500,000	1 in 1	1 in 4	1 in 25	1 in 226	1 in 2,713	1 in 40,696
	1,000,000	1 in 2	1 in 3	1 in 9	1 in 39	1 in 237	1 in 1,775
	1,500,000	1 in 3	1 in 3	1 in 5	1 in 16	1 in 65	1 in 326
	2,000,000	1 in 4	1 in 3	1 in 4	1 in 10	1 in 29	1 in 108
	2,500,000	1 in 5	1 in 3	1 in 4	1 in 7	1 in 16	1 in 49
	3,000,000	1 in 7	1 in 4	1 in 4	1 in 6	1 in 11	1 in 28
	3,500,000	1 in 10	1 in 4	1 in 4	1 in 5	1 in 8	1 in 18
	4,000,000	1 in 14	1 in 5	1 in 4	1 in 5	1 in 7	1 in 13
	4,500,000	1 in 20	1 in 7	1 in 4	1 in 4	1 in 6	1 in 10
	5,000,000	1 in 28	1 in 8	1 in 5	1 in 5	1 in 5	1 in 8
	5,500,000	1 in 39	1 in 11	1 in 6	1 in 5	1 in 5	1 in 7
	6,000,000	1 in 55	1 in 14	1 in 7	1 in 5	1 in 5	1 in 6
	6,500,000	1 in 76	1 in 18	1 in 8	1 in 6	1 in 5	1 in 6

Jackpot Formula

Given these jackpot settings and a floor average of $3,000 T/O per day, on average how often are these Jackpots hit?

Game Rules

V99	Start up ($)	Start up (%)	Increment (%)	Average Prize ($)	RTP (%)
GRAND	$5,000	0.67%	0.08%	$5,597.0	0.75%
MAJOR	$1000	0.39%	0.45%	$2,167.94	0.84%
MINOR	$100	2.57%	0.60%	$123.35	3.17%
MINI	$25	4.86%	1.30%	$31.69	6.16%
Total					10.91%

Total Game RTP: 90.12%

Jackpot Formula

1. Work out the Turnover to Hit

$$\frac{Jackpot\ Start\ up\ (\$)}{Start\ up\ (\%)} = \frac{\$5{,}000}{0.67\%} = \$746,269$$

2. Calculate days to hit

$$\frac{Jackpot\ Hit\ Rate(\$)}{Average\ Venue\ Turnover\ (\$)} = \frac{\$746{,}269}{\$3{,}000} = 249\ \text{Days!}$$

Game Rules

V99	Start up ($)	Start up (%)	Increment (%)	Average Prize ($)	RTP (%)
GRAND	$5,000	0.67%	0.08%	$5,597.0	0.75%
MAJOR	$1000	0.39%	0.45%	$2,167.94	0.84%
MINOR	$100	2.57%	0.60%	$123.35	3.17%
MINI	$25	4.86%	1.30%	$31.69	6.16%
Total					10.91%

Total Game RTP: 90.12%

Jackpot Formula

Major:

$\frac{\$1{,}000}{0.39\%} = \$256{,}410$ Turnover to Hit

$\frac{\$256{,}410}{\$3{,}000} = 85$ Days per hit

Minor:

$\frac{\$100}{2.57\%} = \$3{,}891$ Turnover to Hit

$\frac{\$3{,}891}{\$3{,}000} = 1.3$ Days per hit

Mini:

$\frac{\$25}{4.86\%} = \$514$ Turnover to Hit

$\frac{\$514}{\$3{,}000} = 0.1713$ Days per hit (or 5.84 Hits per Day)

Game Rules

V99	Start up ($)	Start up (%)	Increment (%)	Average Prize ($)	RTP (%)
GRAND	$5,000	0.67%	0.08%	$5,597.0	0.75%
MAJOR	$1000	0.39%	0.45%	$2,167.94	0.84%
MINOR	$100	2.57%	0.60%	$123.35	3.17%
MINI	$25	4.86%	1.30%	$31.69	6.16%
Total					10.91%

Total Game RTP: 90.12%

Jackpot Formula

Expected Net per Jackpot

$746,269 x (1- 90.12%) = $73,731

This game would net $73,731

for every time it has to pay out $5,597. (On average)

Game Rules

V99	Start up ($)	Start up (%)	Increment (%)	Average Prize ($)	RTP (%)
GRAND	$5,000	0.67%	0.08%	$5,597.0	0.75%
MAJOR	$1000	0.39%	0.45%	$2,167.94	0.84%
MINOR	$100	2.57%	0.60%	$123.35	3.17%
MINI	$25	4.86%	1.30%	$31.69	6.16%
Total					10.91%

Total Game RTP: 90.12%

Jackpot Considerations

You're considering installing a new game with a linked jackpot. There are a few jackpot configurations available so how can you decide what's best?

Configuration	Hit Rate	Startup
V99	$1,000,000	$10,000
V01	$2,000,000	$25,000
V02	$1,500,000	$20,000

Jackpot Considerations

- Calculate average EGM turnover, in this example we'll use $3,000.
- If you want the GRAND to go off roughly once a month, how many machines would you need to install?
- Formula: $\frac{Hit\ Rate(\$)}{EGM\ Turnover \times Days}$

Configuration	Hit Rate	Startup
V99	$1,000,000	$10,000
V01	$2,000,000	$25,000
V02	$1,500,000	$20,000

Jackpot Considerations

Configuration	Hit Rate	Calculation	Approx. EGMs
Option A	$1,000,000	$\frac{\$1{,}000{,}000}{\$3{,}000 \times 30}$	11.1
Option B	$2,000,000	$\frac{\$2{,}000{,}000}{\$3{,}000 \times 30}$	22.2
Option C	$1,500,000	$\frac{\$1{,}500{,}000}{\$3{,}000 \times 30}$	16.6

- Formula: $\frac{Hit\ Rate(\$)}{EGM\ Turnover \times Days}$
- These numbers are just an approximation
- Actual T/O of a new game is typically higher than floor average
- What if you don't have space for 11-22 machines?

Jackpot Considerations

What if you only have space/budget for a few cabinets on the link?

Configuration	Hit Rate	EGMs	Calculation	Hit Rate (Days)
Option A	$1,000,000	6		
Option B	$2,000,000	7		
Option C	$1,500,000	8		

- Formula: $\frac{Hit\ Rate(\$)}{EGM\ Turnover \times NumEGMS}$
- Assume $3,000 EGM Turnover per day

Jackpot Considerations

What if you only have space/budget for a few cabinets on the link?

Configuration	Hit Rate	EGMs	Calculation	Hit Rate (Days)
Option A	$1,000,000	6	$\frac{\$1,000,000}{\$3,000 \times 6}$	55.6
Option B	$2,000,000	7	$\frac{\$2,000,000}{\$3,000 \times 7}$	95.2
Option C	$1,500,000	8	$\frac{\$1,500,000}{\$3,000 \times 8}$	62.5

- Formula: $\frac{Hit\ Rate(\$)}{EGM\ Turnover \times NumEGMS}$
- Assume $3,000 EGM Turnover per day

Common Link Questions

- **Is the RTP divided amongst the number of machines on the link?**

  No. Each machine is equally eligible for the Linked Progressives so the RTP isn't divided

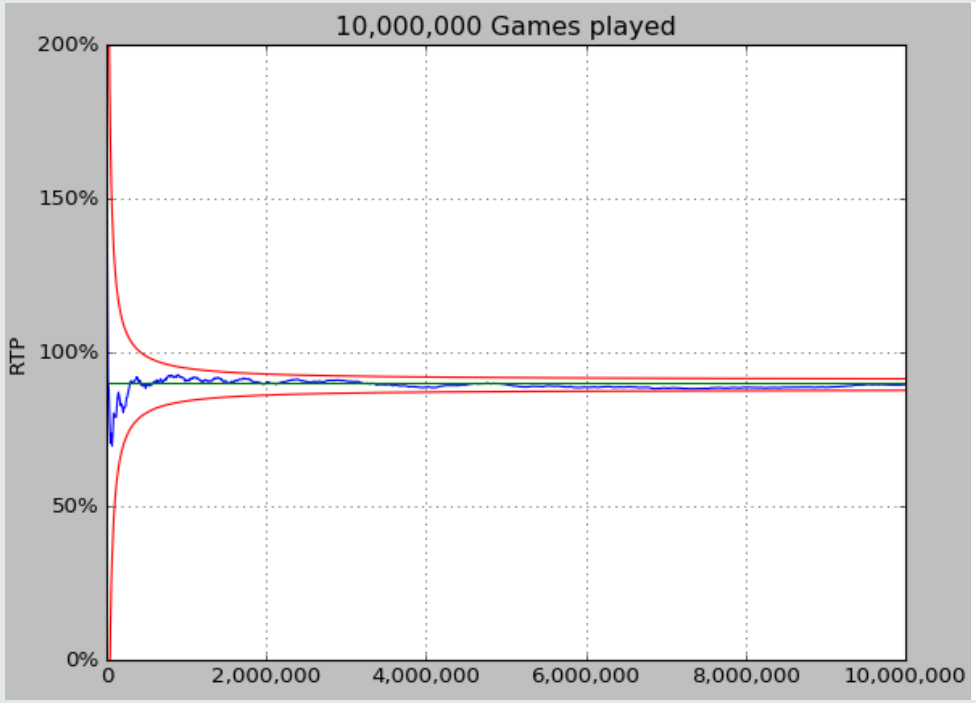
- **The jackpot hasn't gone off for a month and it just went off 5 times this week! Why?**

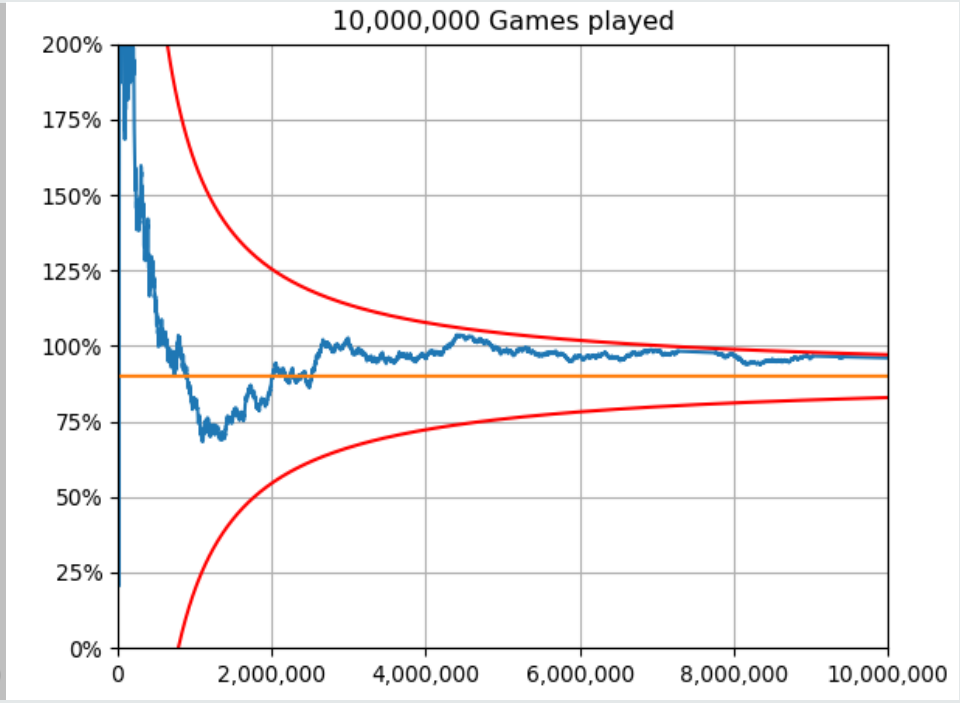
  It's quite likely there's been a lot more turnover on the floor in the last week. Compare the average turnover for the 2 periods and remember that more turnover = more jackpot

- **How does expanding or shrinking a bank change hit rates?**

  Jackpot hits are proportional to the amount of turnover that's gone through a machine or link. Adding machines = more turnover = more hits.

Jackpot Volatility





Questions