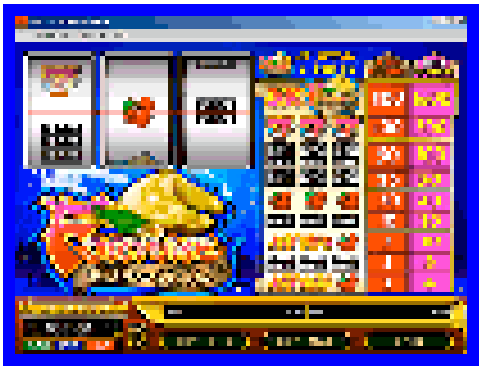
Martin J. Silverthorne

Super Slots!



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INTRODUCTION

There is no doubt that the future of casino gaming lies with the slot machines. In most casinos the "one-armed bandits" are steadfastly encroaching on the territories formerly reserved for table games, and in some cases even by gift shops or restaurants.

Walking through a casino and observing people inserting coins into slots and pulling handles as fast as they can while accompanied by a never ending background noise of bells, whistles, musical tunes and the screams of delight of winners possibly surpasses the excitement of being a spectator at a Roman circus.

Some casino executives have even toyed with the idea of putting slot machines in the patrons rooms, so that a true addict can play without even bothering to get dressed.

The casinos love the slot machines because they produce revenue for the casinos at a lower cost than the table games. Instead of having to hire and train whole crews of dealers, pit bosses and floormen, a few attendants can service a slew of slots. Players love slots because they don't have to know anything to

participate. Slots are easy to understand, easy to play, and in the case of some progressive machines, can net a player a win worth millions of dollars.

No wonder slots are expanding faster than any other casino game. There is no question in my mind that slots are addictive too! As I write this, there is considerable discussion in the news media concerning the addictiveness of nicotine. Without question, growing numbers of persons are becoming just as addicted to slots as the nicotine addicts are to their tobacco products.

Unfortunately, just like everything else in the world, slots are not as simple as they used to be. All of the new versions of slots are computer controlled, with mind staggering numbers of possible winning and losing combinations "built-in" to the slot's programming.

In order to win at slots today, you need to recognize that the game is not the same as it was twenty years ago. In that bygone period, most slots were far simpler than they are today. Many persons wax nostalgic for those less complicated days on many more topics than only slot machines.

Our purpose is to look at slots as they are played now, and as they will be played into the next century. A fundamental question is "can the computer controlled modern slots be beaten on a regular basis?" If your purpose in reading this book is to learn a single gimmick that can be used to beat all slots, in all locations, at all times, you will be disappointed. There is no such animal.

However, if you are willing to invest a little time, to learn about the different types of slot machines, to find a slot with a good opportunity of winning, and then apply some specific techniques to the game, you have come to the right place.

My objective in writing *Super Slots* is to discuss in some detail some winning techniques which can be applied to many different versions of slot machines. I feel that the purpose of playing slots is to win and I hope you share this perspective. We may have some fun along the way, as slots are supposed to be fun, but we will not lose sight of our principle objective of winning.

In doing background research for this book, I assembled a large library of slots books, reports, systems, strategies and just plain superstitions. Because of my own background as a successful businessman with a grasp of mathematics, I brought my own prejudices to my study of this subject. I believe that any winning technique must be based on observed empirical evidence, must be explainable in rational terms and most importantly, must be repeatable. As an example, assume that I just completed a very successful trip to Las Vegas and I won a $1,000,000 slot jackpot. Would it do you any good to know what time of day I played, or what I had for lunch or what I was wearing when I won the jackpot? Could any of these factors possibly aid you in repeating my feat of winning a million dollars?

Unfortunately, much of what has been written about slots falls into this category of "look what I did," or "see what others have done." This information is generally of very little value except for entertainment purposes.

While I hope that you will at least find this book interesting and hopefully somewhat entertaining, this is not my purpose in writing it. My purpose is to share with you empirical, and therefore verifiable, evidence that using a technique which will be described in some detail, will allow you to win regularly on slot machines.

If you judge by what others have written on the subject, there is no method that you can use to regularly win on the slots. My review of slots literature was primarily anecdotal, and, as it turned out, merely provided a background of mostly what not to do.

The information developed for this book has been the product of original research. I used my own wits and a degree of common sense to approach this subject and I believe that you will find that the fruits of this labor are of some value to you.

This book is organized in such a way that we will progress one step at a time in reaching our goal. We will explore the world of slot machines, as there are almost as many types of slots as there are people, and like people, not all slots are created equal.

We will look into the mathematics of slot machines. How are the slots programmed to pay off, and how can we exploit this knowledge to our benefit?

We will learn how to zero in on the best slots in the best locations. From there we will begin building our winning approach to playing slots. When we have completed this process,

we will be well equipped to tackle the one-armed bandits. We will look into the law as it pertains to slots and finally we will reexamine and refine our winning slots strategy.

Some parts of this journey may require a second or even a third reading to grasp the concepts. Let me encourage you to do so, as the results should more than justify the effort.

TYPES OF SLOTS

The origin of the slot machine is traced back to 1887 and its inventor, Charles Fey. Fey's slots contained three reels featuring Bells, Hearts, Diamonds, Spades, Horseshoes and Stars. These slots accepted one nickel at a time and featured a top payout of ten nickels.

Fey did not sell his machines but placed them in saloons on a 50-50 profit split arrangement with the proprietors. In 1929, forty-two years later, Fey built the first slot machine to take a silver dollar. That machine had three reels with fruit and bar symbols and had a top jackpot of $100.

These early machines proliferated, with additional manufacturers, such as Herbert Mills and O. D. Jennings joining the fray. Many different versions of these slots were produced over the years, but all shared similar mechanical parts and produced the familiar slot machine sounds of clicking and clanging as the parts moved around.

By the late 1950s a new breed of slot began appearing. These machines were electrically powered and featured such innovations as multiple coin play, progressive jackpots and many more anti-cheating safeguards than the old mechanical machines.

By the 1970s manufacturers began using solid state circuitry to develop the first totally electronic slots machines. These machines were short lived as solid state technology was replaced by microprocessors.

Microprocessors are commonly called "chips" and are really miniature computers working with other electronic components using integrated circuits to control the machines. Here the microprocessor controls all aspects of the slot including the reels.

Programmed into each slot are formulas which are translated into certain combinations and arrangements of the symbols which appear on the reels. As part of this process, random numbers are generated by the microprocessor and these numbers are used to determine the symbols appearing on the reels and consequently, the payoffs.

Because of the reliability of micro-technology, these slots are more predictable than the earlier mechanical or electrically powered slots. If a machine has been programmed to pay off 94.3% of all coins played into it, then over a reasonable amount of time, this machine will perform very close to this specification. The casinos like the microprocessor controlled machines because of their reliability and predictability. Many players bemoan the

decline of the mechanical slots for the very reason that these machines were more likely to malfunction and perform such feats of generosity as overpaying the players.

The single coin slots are a thing of the past, having passed away with the demise of the mechanical slot machines. You may still find some of the old mechanical slots at roadside locations. They are usually nickel machines with jackpots of just a few dollars.

Modern slot machines accept more than one coin and will multiply the size of the payoff by the number of coins played. Because of this feature these machines are known as **multipliers**. Most of these machines accept three to five coins maximum per pull although some types will accept 8, 9 or even 10 coins.

Most of the multipliers have a single payline across the reel display area. All payoffs are based on the combinations of symbols showing after the reels have come to rest. The multiplier aspect increases the payoff for each winning combination of symbols. In some cases, a bonus may be paid for playing the maximum number of coins if the machine hits the highest jackpot.

For example, on a three reel machine where 7 7 7 is the highest payoff, the slot may pay 100 coins for one coin played, 200 coins if two coins are played and 600 coins if three coins are played. The payout for a jackpot with three coins played has a bonus of 300 coins offered. Many of the progressive slots, which offer increasing jackpots as the machine receives more play, are structured along the lines of the bonus machine, with the jackpot paid only if the maximum number of coins are played.

The casino's rationale in offering the bonus or jackpot for playing three coins per pull is to entice more players into always playing the maximum number of coins.

Many multipliers do not offer bonuses for playing the maximum number of coins. These machines increase the payoffs proportionately to the number of coins played, with no bonuses for playing with the maximum number of coins.

Multipliers that do not offer the bonus feature can be played as single coin machines as well as multi-coin machines without sacrificing any advantage in the payoffs.

Table 1 shows the pay schedule for a typical 3 Reel 3 Coin Multiplier. We will refer to this type of machine as a **Standard 3 Coin Multiplier.**

Table 1. Standard 3 Coin Multiplier

Symbols	1 Coin	2 Coins	3 Coins
Cr Cr Cr	50	100	150
B B Bar	15	30	45
DBC DBC Bar	15	30	45
Bar Bar Bar	10	20	30
Ch Ch Ch	10	20	30
B B B	5	10	15
DBC DBC DBC	5	10	15
Any 1 C	2	4	6

Cr = Crown B = Bell
Bar = Bar Ch = Cherry
DBC = Double Bar Cherry

On a Standard Multiplier, as shown in Table 1, payoffs increase exactly proportionately to the number of coins inserted. We can play one, two or three coins on such a machine with no penalty for not inserting the maximum number of coins.

Table 2 shows a **Standard 5 Coin Multiplier** for a slot with three reels. Like the 3 coin version, there is no penalty for not playing the maximum number of coins.

Table 2. Standard 5 Coin Multiplier

Symbols	1 Coin	2 Coins	3 Coins	4 Coins	5 Coins
TC TC TC	100	200	300	400	500
DC DC DC	20	40	60	80	100
C C C	10	20	30	40	50
Any 3 Cherries	2	4	6	8	10

TC = Triple Cherry C = Cherry
DC = Double Cherry

Progressive Slot machines pay much larger jackpots only when the maximum number of coins are played. Table 3 shows the payoffs for a three reel slot with a progressive jackpot of over 25,000 coins. This jackpot is paid when 7 7 7 lines up and the full jackpot amount will only be paid when three coins have been played.

The **Option play machine**, also called the **Buy-a-Pay slot machine**, can be very confusing. With these machines, each coin inserted brings into play additional symbols offering payoffs. There is nothing on these machines to specifically identify them as option machines. You must read the payout schedule on the front of the machine carefully to spot one of these critters.

Table 4 shows the payoff schedule for an **Option 3 Coin Multiplier**. Playing one or two coins brings the payoff schedule,

shown on the left side of the table, into play. Only when three coins are played do the symbols on the right side of the table come into play. If you had played two coins and the symbols C C C appeared, your payoff would be zero, as this combination of symbols pays off only when three coins are inserted.

Table 3. Progressive 3 Coin Multiplier

Symbols	**1 Coin**	**2 Coins**	**3 Coins**
7 7 7	100	200	Jackpot
B B Bar	15	30	45
O O Bar	15	30	45
C C C	10	20	30
Bar Bar Bar	5	10	15
O O O	5	10	15
B B B	5	10	15
Any 1 Cherry	2	4	6

7 = Seven O = Orange
B = Bell C = Cherry
Bar = Bar

Table 4. Option 3 Coin Multiplier

Symbols	1 Coin	2 Coins	3 Coins	Symbols	3 Coins
$ $ $	50	100	200	CCC	300
B B B	10	20	30	B B B	60
- - B	2	4	6	S S S	60
Any 2H	2	4	6	$ - -	15

$ = Dollar Sign S = Spade
B = Money Bag D = Diamond
H = Heart C = Club

The Option type of slots offers limited possibilities of playing from one to the maximum number of coins as playing less than the maximum number of coins reduces the number of combinations of symbols offering payoffs.

Another version of slot machine, which requires maximum coin play in order to bring all of the payoff combinations into play, is the **Multiple Pay Line machine**. Instead of offering only one pay line, there may be two, three or even five pay lines. As each additional coin is inserted, another pay line comes into play. Like many of the multipliers, the jackpots or jackpot bonuses are available only on the last payline, so that you have to play the maximum number of coins to win the jackpot. Table 5 shows the payoffs for a 3 reel, 2 coin multiple pay line slot. While the payoff symbols are the same whether one or two coins are inserted, the

second pay line only comes into play with the insertion of the second coin.

Table 5. Multiple Pay Line 2 Coin Multiplier

Symbols	1 or 2 Coins
Cr Cr Cr	100
O O O	20
A A A	10
B B -	5
- B B	5
S S -	5
- S S	5
Any 1 Cr	1

First coin activates first pay line, second coin, second pay line.

Cr = Crown B = Banana
O = Orange S = Strawberry
A = Apple

Each of the examples of payoff tables shown here are merely representative examples. There are hundreds of variations of slot payoffs and in order to determine the type of slot you are about to play, you must read the payoff schedule shown on the front of the machine.

On the multiplier slots, the insertion of each coin will cause a different section of the payoff schedule to light up, showing the applicable payoffs for the number of coins played. Always make sure that each coin inserted causes this to happen. If you insert a coin which doesn't register, and then pull the handle without verifying its registration, you will not be paid the full amount of a payoff. If a machine does not register a coin played, you should immediately notify a slot attendant.

The progressive slot machines have brought a new glamour to slot machines. The million dollar plus jackpots you hear about people winning are won on progressive slots.

With a progressive slot machine, the jackpot is increased each time the machine is played. Progressive slot machines are multipliers which keep adding to the jackpot until it is hit.

The progressive machines can be found in two different types of setups. The older and more common types of progressives are individual free-standing machines which will be found either by themselves or in a designated area with other jackpot machines. These machines operate independently of each other so that each machine's jackpot is unaffected by any other slot machine.

In response to the state lotteries, slot machine manufacturers have developed machines which are linked together and share the same jackpot. The machines, called **Link-Progressives** are even linked between different casinos. Each machine in the system contributes to the jackpot which continues

to grow with each play on a machine in the system. Many of these machines receive enough play to cause the jackpot to grow by a hundred thousand dollars or more per week.

The MEGABUCKS system, introduced by IGT Corporation, is a prominent example of a link-progressive system with different casinos participating. MEGABUCKS jackpots often total in the millions of dollars.

There are many other variations of slot machines. Some slot machines pay only jackpots. With these **Jackpot-Only machines**, all of the symbols offering smaller payoffs have been removed from the reels. You can spot these machines fairly easily as there are many blank spots, sometimes called "ghosts" on the reels. With these machines, the payoffs are very infrequent.

Other varieties of slots are the giant slot machines or "Big Berthas." These monsters have up to eight reels, are slow to play, and have terrible payoffs. The Four Queens in downtown Las Vegas boasts the world's largest slot called "The Queen's Throne." The machine is designed for one to six players, who sit in "thrones" around this behemoth. The odds of hitting the big jackpot on this Bertha could be as high as 55 billion to one!

Video slots have been coming on very strongly the past few years, with video poker leading the pack. Instead of levers, the machines are activated by buttons and offer the players the chance to influence the outcome of each play through the exercise of skill, rather than pure chance. In addition to video poker machines, there are video blackjack, video keno, video horse racing and video craps.

The most popular of the video slots is unquestionably video poker, with the five card draw version reigning supreme. Here the degree of the player's skill in determining which of five cards drawn on an initial hand to hold and which to discard can have a major impact on the his ability to win. Certain versions of the game offer the opportunity of playing at an advantage to the casino, if the player's skill is up to it. While video poker is beyond the scope of this book, two excellent books have been written on the game. *Winning With Expert Video Poker* covers all the major versions of video poker and shows specific strategies the player can use to beat the game. *Beat Joker Poker!*, which I wrote, focuses on the Joker Wild version of video poker and has complete strategies for playing with player advantage. Both books are available through Silverthorne Publications, the publisher of this book.

A final category of slots are the specialty machines, such as the pusher games. Pusher machines are based on an old arcade game and have two or three shelves of coins which are pushed around by paddles. When the machine is played by inserting coins into one to four slots, an impeller shoots the coin up onto the shelves for an instant win in one of the five holes on the wall above the shelves. If your coin misses the hole, it may knock other coins off the shelves and into the payout chute below. This game and other carnival like games such as horse racing, should be played for amusement only as the winning prospects are very poor.

With the large variety of slot machines, it is no easy task to pick the right machine. One of the most important things to do in

picking a machine is to carefully read the instructions and payoffs before beginning to play it.

The strategies developed in this book will focus on only certain of the multipliers. We have presented several tables in this chapter so that you can become familiar with the differences between multipliers. You should be able to easily distinguish between a **Standard 3 or 5 Coin Multiplier** and a **Progressive Multiplier** or an **Option or Multiple Pay Line Multiplier**.

Other aspects of picking the best machine to play are the house advantage on the machine, the exact configuration of the machine's payoffs, your bankroll, the time you have available to play and your ability to follow and adhere to a defined strategy. We shall explore each of these aspects as we continue our journey.

THE MATHEMATICS OF SLOTS

All gaming machines are designed to pay the player back a percentage of what is played. The amounts vary from machine to machine and from casino to casino. All machines have one thing in common: The longer the machine is played, the closer the actual payouts will be to the theoretical results.

Slot machines use a random selection process to achieve a set of theoretical odds. Random selection means that each time the lever is pulled and the reels are set in motion a combination of symbols are randomly selected. The "random" aspect ensures that each pull of the handle is independent from every other pull, so that the results of the previous pull, and the one before that, have no effect on the current one.

The theoretical odds are built into the design and program of the machine, and it is possible to calculate the exact payout percentage for any machine over the long-term.

Except for the video slots, slot machines have wheels called reels with symbols printed on each wheel. Each reel symbol represents a **stop** which may come to rest on the payline, and may

or may not be part of a combination of symbols resulting in a payoff.

The likelihood of winning any payoff on any slot machine is related to the number of reels and the number of symbols on each reel.

The most common type of mechanical slot machine has three reels with twenty symbols on each reel. To calculate the total number of combinations of symbols on this machine, we multiple the number of stops (symbols) on each reel by the number of stops on each of the remaining reels. For a three reel machine with twenty stops per reel, we have 20 x 20 x 20 = 8,000 combinations of slot symbols.

If a jackpot offered on this machine pays on 7 7 7 and only one 7 symbol is on each reel, then the probability of hitting this jackpot is 1/20 x 1/20 x 1/20 or one in 8,000. If two 7 symbols are on one reel, then our calculation is 2/20 x 1/20 x 1/20 for a probability of 1/4,000 of hitting the jackpot.

Likewise, we can calculate the probability of any combination of symbols hitting if we know the number of times each symbol appears on each reel.

When mechanical slots dominated, it was not too difficult to count the symbols on each reel and determine exactly the payoff of a given machine. With microprocessor controlled slots this task has become almost impossible, as the number of stops per reel can be as many as 256. To determine the payoffs of such a machine

would require significant reverse engineering and is beyond the scope of almost every player.

The number of reels has a greater effect on the probabilities than the number of symbols per reel. If we compare a machine with 32 stops per reel and 3 reels, with a 22 stop per reel machine and 4 reels, you will see the tremendous difference another reel makes:

32 Stop, 3 Reel: 32 x 32 x 32 = 32,768 combinations
22 stop, 4 Reel: 22 x 22 x 22 x 22 = 234,256 combinations

If we consider a 5 reel machine with 32 stops per reel, we find over 33 million combinations!

Every slot machine has a predetermined payout percentage. When you hear things like "our slots pay back 98.3%" this means that over the long-term for every dollar inserted in the machine, it will return 98.3 cents. Conversely, we could state that as for every dollar played, the casino will retain 1.7 cents. These percentages only hold true over very long-term play consisting of hundreds of thousands or even millions of plays.

Many people misinterpret these percentages and think that if they play with $100.00 on a 98.3% payback machine that they can only lose $1.70. There are a couple of things wrong with this line of thinking. First, theoretical percentages will be attained only over long periods of play. Over a few dozen, or even a few hundred rolls, the payback percentage will vary greatly. Secondly, if a person brings $100.00 for slot play, he or she usually will not limit his or her play to inserting this amount of money into the

machine only one time. Most people will buy twenty dollars worth of tokens and continue to play with this money until it is gone. After inserting the first round of coins in the machine, they will continue playing with any coins left in the tray, and they will continue this pattern until no coins are left. And then they wonder how it was possible for a 98.3% slot to take all of their money.

The answer is that the casino continues to extract its percentage on every coin inserted into the machine. The player will not limit his play to twenty dollars or one hundred dollars but will continue to redeposit coins. The machine will, at least over the long-term, continue to grind away at all money played.

Table 6 shows the devastating effect the house edge can have on the player's bankroll. This table compares slot hold percentages of from two percent to fifteen percent for ten rounds of play, starting with $100.

Table 6. Amount Retained Per Round of Play

Slot Hold %	2%	5%	10%	15%
Start Round	$100	$100	$100	$100
1	98	95	90	85
2	96	90	81	72
3	94	86	73	61
4	92	81	66	52
5	90	77	59	44
6	88	73	53	38
7	86	69	48	32
8	85	66	43	27
9	83	63	39	23
10	81	60	35	20

With a 15% casino hold, there is only $85 left after one round of play, and after ten rounds the $100 has been reduced to only $20. If we continue to play the 15% hold game, after twenty rounds we will be down to about $4. We can see the power of a hold rate of 15%.

If we contrast this with the 2% hold rate, we see that after ten games we still retain $81. Even though we have gradually lost some money on this machine, we can see that hitting a single higher payoff would put us ahead and that we have gained much

more playing time to do so. If you never cared what the casino hold was before, this should open your eyes. It is imperative that you always seek and play machines with lower hold percentages.

Unfortunately, casinos do not label their machines with the hold or payback percentages. However, the player's win rates are available for different locations. Table 7, which shows the win rates for different United States casino locations, was derived from information published by the Casino and Gaming Control Boards and Commissions of Nevada, New Jersey, Illinois, Iowa, Connecticut and Colorado.

If we were seeking to play the highest payback slots, we might begin our search with this information. The highest average payback in the U.S. is in Downtown Las Vegas, with an average payback of 95.4%. The average for all Nevada casinos is 95.06%. The next best place to play is in Colorado, with an average rate of 93.06%.

Moving east, we find that the Illinois river boats offer the third best choice at 92.3%, followed by Foxwoods in Connecticut with 91.7%, the Iowa's river boats at 91.63%, and in last place the Atlantic City casinos with an average payback of 91.23%.

We also notice that the win rates increase with the size of coin accepted, with the nickel slots paying out the lowest percentages and the five dollar slots the highest. In Nevada, the win rates average about 95% for all but the lowly nickel slots. So, on the average, it is safe to say that if we limit our play to Nevada casinos and avoid the nickel slots, we can expect to receive about a 95% payback.

Conversely, if we limit our play to nickel slots on the Illinois river boats, we will average a measly 89.85% win rate.

If we decide to limit our serious playing to Nevada, and stay with $1 slots, we will find our best action in Reno. If we are a quarter player, then Downtown Las Vegas is the best deal in the U.S.

Table 7. Casino Win Percentages

Location	5¢ Win%	25¢ Win%	$1 Win%	$5 Win%	Total Win%
Nevada November, 1993					
Las Vegas-Downtown	91.3	95.8	95.1	96.7	95.4
Las Vegas-Strip	88.9	94.1	95.3	96.3	94.7
Laughlin	87.9	94.6	95.9	96.7	94.9
Reno	91.8	94.1	96.2	97.4	95.4
Lake Tahoe	90.3	93.4	95.6	96.8	94.9
Average	90.04	94.40	95.62	96.78	95.06
Atlantic City January, 1994					
Average	89.95	90.91	91.63	94.18	91.25
Connecticut January, 1994					
Foxwoods	90.5	91.3	91.9	94.4	91.7
Illinois December, 1993					
Average	86.3	90.69	93.06	94.37	92.30
Iowa January, 1994					
Average	92.50	90.90	92.60	NA	91.63
Colorado December, 1993					
Average	89.33	92.87	94.00	95.17	93.06

Examining an individual slot machine in some detail will further illuminate how slots are programmed to pay off. We will analyze a 3 reel, two coin multiplier which pays bonuses on two of its payoffs. The pay schedule for this machine is shown in Table 8.

Table 8. Pay Schedule for Option 3 Reel 2 Coin Multiplier

Symbols	**1 Coin**	**2 Coins**
7B 7B 7B	200	1000
5B 5B 5B	50	150
1B 1B 1B	10	20
AB AB AB	5	10
— — —	1	2

7B = Seven Bar 1B = One Bar
5B = Five Bar — = Blank or "Ghost"

Bonuses paid on 7B 7B 7B and 5B 5B 5B when two coins are played.

The first step in analyzing this machine is to break out the number of symbols (stops) per reel. This particular machine has 32 stops per reel and the reel analysis is shown in Table 9.

Table 9. Reel Analysis Option 3 Reel 2 Coin Multiplier

	Number of Symbols per Reel		
Symbol	**Reel 1**	**Reel 2**	**Reel 3**
7B	2	1	1
5B	5	4	4
1B	9	9	9
—	16	18	18

With 3 reels of 32 symbols each, we have a total of 32,768 combinations of symbols possible (32 x 32 x 32 = 32,768). Since bonuses are offered when the second coin is played, we will add another 32,768 different combinations with play of the second coin. On this machine, we will use totals of 32,768 combinations with one coin played and 65,536 combinations when two coins are played. Table 10 shows an analysis of all winning combinations on this machine.

Table 10. Analysis of Winning Payoffs

Combination	# on Reels	Hits	Deduct	Payouts 1 Coin	Payouts 2 Coins	Payout%
7B 7B 7B	2 1 1	2	-0-	400	2,000	1.4%
5B 5B 5B	5 4 4	80	-0-	4,000	12,000	14.0%
1B 1B 1B	9 9 9	729	-0-	7,290	14,580	25.6%
AB AB AB	16 18 18	3,136	811	11,625	23,250	40.8%
— — —	16 18 18	5,184	-0-	5,184	10,368	18.2%
Totals		9,131	811	28,499	62,198	100.0
Less Deducts		- 811				
Net Hits		8,320				

The first column shows each winning combination. In the second column, labeled "# on Reels" are the number of symbols on each reel. For example, for the combination 5B 5B 5B, there are five 5B symbols on the first reel, 4 on the second reel and 4 on the third reel. Following this same combination of symbols across the table, the next column shows the total number of winning combinations (called Hits). For the 5B 5B 5B combination, we have 5 x 4 x 4 = 80 hits. The next column, labeled Deduct shows the number of times that a symbol is used in computing a different payoff, with the same symbol used. It is deducted so that we don't count the same symbol twice. You will notice that in the row for AB AB AB we deduct 811 hits from the total number of hits for this combination of symbols. This is done because 729 of the Bar

symbols will be the combination 1B 1B 1B and 80 of the Bar symbols consist of the combination 5B 5B 5B for a total of 811 Any Bar hits which have been included in different payoff combinations.

The Payout Columns are broken down into payouts for one and two coins played. The amounts in these columns have been computed by multiplying the payoff for each combination of symbols, as shown in Table 8, times the number of Hits for that combination. Returning to the 5B 5B 5B combination, we compute the payouts for one coin as 80 Hits x 50 coins for a payout of 4,000 with one coin played. When two coins are played and this combination shows, we compute the payout as 80 Hits x 150 coins = 12,000 coins, reflecting the bonus payoff.

If we add up the total number of hits, we have a total of 9,131 hits, before deducting overlapping symbols. Deducting 811 for overlaps gives us a net total of 8,320 hits which will pay off on this machine.

To compute the amount the slot will retain, we divide the total number of payouts by the total number of possible combinations for:

Payouts	# of Payouts	Total Combinations	Payout Percent
1 Coin	28,499	32,768	86.97%
2 Coins	62,198	65,536	94.90%

If you will look at the last column in Table 10, showing the Payout Percentages you will notice that almost 85% of the payouts occur on the lower paying combinations which pay out 1, 5 and 10 coins with only one coin played (18.2% + 40.8% + 25.6% = 84.6%). For ordinary play, the higher paying combinations of 5B 5B 5B and 7B 7B 7B, with a combined percentage of the machine payout of about 15% (1.4% + 14.0%), are much less relevant to assessing how will this machine will pay for short-term play. File this fact away for future reference as we shall use this information as part of our basis for developing our winning slots strategy.

FINDING THE BEST MACHINE

Everyone who has ever played slots for at least five minutes seems to feel that they are qualified to find the best slot machine.

"Best" usually means the "loosest" slot, meaning that the machine seems to pay out more coins than have been played, at least for a time period. There are as many theories as there are people on how to find this elusive machine.

Some people believe strictly in luck. If they were wearing their lucky hat the last time that they played and won, then they will ascribe their luck to this hat and be sure to wear it every time they play.

Others like to talk to the slot machines while they play. I once played next to an elderly lady who started out telling her machine to "Be good to Mama, Baby," followed by an occasional pat on the front of the machine. After about thirty minutes her tune had changed to "Pay up you tight son of a bitch," followed by a whack on the machine glass.

Some folks like to test the temperature of the machine before they begin playing. If the machine is warmer than the other machines, then this qualifies the machine as a "hot" one, suitable for play.

Some people will only insert cold coins into a machine, claiming that if warmer coins are used, the machine tightens up.

Many players believe that slots should be played only at night or on the weekends, or some other variation of timing.

Still others believe that the rhythm used in pulling the handle is the secret. Implementation of this theory includes such variations as the short hard pull and the slow, almost delicate pull. Each has its adherents.

Others use the "the attendant must know" theory and ask the slot attendant which is the best machine to play. A variation of this is to observe another slot machine when playing and if the machine has not paid a jackpot in a long time, to consider playing the machine as it should be ready to pay.

The location within the casino is also important for many players. Some players claim that aisle machines are the best, while others believe that the loosest slots are hidden in back corners so that they don't get much play.

I wish I could tell you that one of these approaches works. You may consider that I have saved you some money, as each of these approaches have been touted at one time or another in slot publications of dubious value. I recently purchased a slot book

which spent several pages describing how hot and cold machines are laid out in a casino based on the author's theory of how casino executives are supposed to think.

I don't have much to say about the "luck" or clairvoyance theories of slot play. Perhaps some folks got it and some don't. I know that I don't do very well when I rely purely on luck. If luck does work, I have the impression that it is a very personal thing, and I don't have any advice on how you may increase yours vis a vis winning at slot machines. I am going to assume that you are like me and believe that luck comes to those who are prepared, so we will concentrate on becoming more prepared.

The time of day theories are really absurd. Many players believe that the casinos can push a button inside a slot, or jiggle a couple of levers and change the payouts. With the microprocessor controlled slots, the chip itself must be changed to affect the payout percentages. Changing the chip requires the skill of a trained technician and several hours work. It is also an expensive proposition for a casino to be constantly changing its slots. You can rest assured that slot payouts in a particular casino will not change with nightfall or from a weekday to a weekend.

Obviously, talking to the machine or even caressing it, is not likely to have any effect on a computer chip controlled mechanism. Neither is the temperature of the machine (which is probably most affected by the temperature around it) nor the warmth of the coins. Slot machine levers have zero influence on the random number generating chip controlled machines. The machines could just as easily be activated by a button (as are the

video slots) or a pull string. The days of handles activating gears which determined the rate of spin of the reels are long gone.

All of these theories may occasionally win some money for their adherents, but consider: **Randomly selecting any machine may work just as well.**

We are after something a little more definitive. Let's look first at some of the characteristics of the different types of slot machines.

One of the attributes we will look for on any machine is the ability to play from one to as many as five coins without any penalty for playing less than the maximum number of coins. Why? Because we want the flexibility to adjust the size of each wager dependent upon the exact playing conditions we are facing at that exact moment.

This condition knocks out of contention any single coin slot machines. With a single coin slot, the only option we have is to insert a coin and pull the lever. It is a win or lose proposition, with no alternatives other than changing machines. To have the best chance of winning, we will demand the flexibility to vary the number of coins based on each individual machine's attributes.

With this one condition, we will rule out play on any of the single coin mechanical machines. This restriction is not too severe, as these machines can only be found in a few downtown casinos in Las Vegas, and scattered about other Nevada sites.

By requiring that no penalty be imposed for playing with less than the maximum number of coins accepted by a particular machine, we will also rule out a number of multipliers which do impose this penalty. We will not want to play on any Option Multipliers (buy-a-pay) slots as these machines bring additional symbols into play with additional coins inserted so that with less than the maximum number of coins played, the number of winning symbols are severely reduced.

Less obviously, but using the same logic, we will reject playing on the Multiple Pay Line machines, which accomplish the same thing as the Option machines by bringing additional pay lines into play as additional coins are inserted.

A second condition we will impose is that the machine we select to play is a **High Frequency** machine. By high frequency, we mean that the machine has been programmed to pay off many lower payoffs more frequently rather than a very small number of higher payoffs.

Table 15 compares the hypothetical payoffs of Low and High Frequency slot machines.

Table 15. Comparison of High and Low Frequency Slots

High Frequency Payoffs		Low Frequency Payoffs	
Payoffs (# Coins)	**Percent of Total Paid Out**	**Payoffs (# Coins)**	**Percent of Total Paid Out**
2	20%	2	10%
10	49%	5	10%
20	25%	10	25%
100	1%	15	32%
		1000	18%
Total Payoffs	95%		95%

If we look at the payoff schedules on these two machines, we don't have much of a clue as to which is the higher or lower frequency machine. Both machines have similar payoffs, and both machines will ultimately pay back 95% of the coins played. Having the benefit of using this table, we can see that the high frequency payer will return a higher percentage of the coins played on the payoffs of 20 coins or less. If we add the payoff percentages for all payoffs of 20 coins or less on the high and low payoff machines, we find that 94% of the payoffs on the high frequency version are for payoffs of 2, 10 or 20 coins, while only 77% of the low frequency machine payoffs are for 2, 5, 10 and 15 coin payoffs.

For our purposes, the machine paying 94% of its payoffs on payoffs ranging from 2 to 20 coins is the better machine, as it is more likely that we will hit one or more of these payoffs in short-

term play. While the lower frequency machine returns exactly the same overall payback of 95%, it accomplishes this by making fewer lower coin payouts and concentrating a higher amount of its payback in the less frequently hit jackpot payoff of 1,000 coins.

In short-term play, we are not likely to ever hit the jackpot payoff. Since 18% of the slot's overall payback is represented by this jackpot, in simple terms, by not hitting the jackpot, our return will be reduced by 18%, a large percentage of the expected payback.

We discussed locations of slots in a general way in the previous chapter. We found that the best paying slots are located in the state of Nevada, and on the average, the lowest paying slots are in Atlantic City. Of course this is from your and my perspective. If you owned a casino, you would prefer the lower payout Atlantic City slots.

Another aspect of finding the best slot machine is picking the best casino in the best location. Unfortunately, casinos are not very forthright on their exact hold percentages so that this task is not always that easy.

We can, however, refine our selection process somewhat without knowing the exact hold percentage of each casino.

First, we know that we should confine our play to casinos. Grocery stores, service stations, bars, airports and other non casino locations often have paybacks of from 50% to 75%. Your money will disappear very quickly if you decide to regularly play the slots at Joe's All-Nite Market. Needless to say, you should stick with

legal slot machines. If you decide to play illegal slots, who knows what extortion will be enacted on you. And you will have little recourse if you are cheated.

The airport slots at McCarran International Airport are notoriously tight, although I have been known to play them on occasion to enjoy a diversion not usually found in the airports of the world. An elderly neighbor of my mother had an interesting experience at the Las Vegas airport. His plane was already boarding when he hit a $100 jackpot on a quarter machine. Realizing that he did not have time to change the coins into bills, he began stuffing the quarters into every pocket he had. When he finally waddled onto the plane, with quarters bulging in every pocket, his pants fell down from the weight of the quarters. The entire plane gave him a round of applause.

There are many theories about where the best machines are located in casinos. Some players believe that machines located at the end of aisle hold the key to fame and fortune, while others will swear by different locations. If you have ever read about slots, it is likely that you were treated to the author's pet theories about where the best machines were.

To try to separate truth from fiction, I devised a simple experimental approach. Playing with a group of friends who agreed to participate in the experiment, we played a number of casinos systematically and recorded the results. In order to limit the number of variables for each trip to a casino, we played only the same denomination machines, e.g. nickel, quarter, dollar or five dollar machines. Our only variation in these experiments was the location of the slots in the casinos. Each trial was at least at

hour long, each player used the same session bankroll, and each player played at roughly the same speed. Over the years, I was able to accumulate a number of these trials. While admittedly deficient in a number of ways (for example we played on slots manufactured by different companies, rather than same company slots, and all of our trips were to Las Vegas so that we didn't "sample" other slot venues), I feel that the results clearly indicate a pattern of placement of slots by the casino executives.

We refined the terms "loose and tight" to include three categories of machines:

> Loose machines were those whose estimated paybacks were from 97—99%.
>
> Middle paying machines paid out at from 93—96%.
>
> Tight slots paid out less than 93% of the coins played.

Let's apply these criteria to different slot denominations. The tightest slots are without question the nickel slots. We found virtually no nickel slots that we would term loose. There are some middle paying nickel slots, but by far the largest category of the nickel machines fall into the "tight" group. Published industry payout percentages confirm this. As of the latest information at this time, nickel slots paid out an average of 90.04% in Nevada, 86.3% in Illinois, 92.5% on the Iowa river boats, and 89.33% in the Colorado casinos. No information was available on nickel machines, if any, in Atlantic City or Foxwoods in Connecticut.

The nickel slots seem to be a special category in terms of placement in the casinos. Virtually no pattern was detected in placement of the "better" nickel machines. Perhaps this is because there are so few nickel slots which are other than tight. If you are a nickel player, our advice is to strictly look upon this as recreation, as the chances of winning are poor.

With the quarter, dollar and five dollar machines, we found definite patterns on placement of the machines. Before discussing placement, let's talk about the general payback characteristics of these machines. As you might suspect, the quarters are tighter than the dollar machines, which are tighter than the $5 machines.

Referring to published data again, in Atlantic City, the quarter machines paid back at average of 90.91%, the dollar machines, 91.63% and the $5 machines 94.18%.

In Nevada, these percentages were: quarter machines, 94.4%, dollar machines 95.62% and $5 machines, 96.78%.

At Foxwoods, the paybacks were: quarter machines 90.5%, dollar machines 91.9%, and $5 machines 94.4%.

On the Illinois river boats, the machines paid out: 90.69% for the quarter slots, 93.06% of the dollar slots and 94.37% on the $5 slot machines.

In Colorado, the payouts were: 92.87% for quarter machines, 94.0 on the dollar machines and 95.17% on the $5 slots.

Sailing out of Iowa, the river boats offered 90.9% for quarter play, 92.06% for the dollar slots with no $5 information available.

We found that the location of the slot machine in the casino had a positive correlation with how tight or loose the quarter, dollar and $5 slots were.

The pattern we discovered seemed to be based on how visible the slot machine is to other slot players. The rationale here seems to be to place the loosest slot machines so that other slot players will see winners on the looser slots and be encouraged to continue playing.

There was no apparent pattern to placing looser slots near outside entrances or on open aisles to "entice" persons casually walking by to begin playing slots. Likewise, there was no pattern of looser slots being located in areas where persons stand while waiting for a show. The overall pattern of slot placement was to place the loosest machines in the general slot area in the most visible locations, with a few looser machines scattered in the slot rows.

Loose machines were invariably placed next to middle or even tight machines. In no cases did we ever find two loose slots side by side.

The table game area has some of the tightest slots in the casino. We surmised that since table game players are not traditional slot players, and typically only play a few coins in slot

machines before or after playing a table game, that the casinos recognized this tendency and accordingly placed their tightest slots adjacent to the table games.

A surprising development was the discovery that many middle and loose slots may be located near the coffee shops in casinos. At first, this location puzzled us, as this would not seem to fit the pattern of locating the best paying slots near the slot playing area. One day, several of us had taken a break from playing at the Frontier, and we commented on the constant noise of nearby slots as coins fell into the trays and occasional bells and other assorted noises were emitted by the machines as well as the players.

A rationale for placing some of the better paying slots near the coffee shop then occurred to us. Any slot player, taking a break in the coffee shop could not help but hear the constant sounds of slot coins falling into trays. For many players, this would act like a siren call to return to playing the slot machines as quickly as possible. So placing some of the better paying slots near the coffee shop did make sense, if the casino's intention was to encourage even more slot machine play.

Incidently, any slots near any of the upscale restaurants in the casinos were invariably tight. Apparently the casinos feel that slot players are more likely to visit coffee shops, or perhaps (and I doubt this) the casinos were just being more considerate to the restaurant patrons in reducing the noise level they were subjected to while dining.

Overall, the best paying slot machines will be found in the slot playing area, so long as the machine is not too close to the table games. In the slot area, the elevated carrousels are a good place to find the loosest slots. Another location is in areas where there are one or more slots in a small group, separated from the main banks of slots, but clearly visible to two of more slot banks.

Another surprise was to find that many casinos place some of the better paying slots near the slot change booths. If you observe these machines, you will see that they don't get much play when the casinos are uncrowded. A typical player will get tokens and then find a machine away from the commotion that is adjacent to the change booths. However during peak playing times, after 10:00 at night and on the weekends, players are forced to play the machines next to the change area because of crowded conditions. Since this is a highly visible location, we surmised that the psychology of placing some of the better paying machines here would be to encourage some the players who have been loosing to "give it one more try" and play a little longer.

Encouraging slot players to continue playing seemed to be a clear theme in placement of the looser slots. If you think about this, it makes perfect sense from the perspective of the casino. Don't waste your money on table players or persons standing in a show line, as these are not persons who have set about the task of playing slot machines diligently for some time. The table-show line players are killing a few moments time, with no real expectation of winning, so why not accommodate them?

Players in the slots area are attempting a real go at making some money at the slots. They have already made a commitment

to play for a time, but they may need a little encouragement as the casino percentages eat away their bankrolls. So the casino provides this by placing better paying slots in locations that will draw the most attention to themselves and help give the discouraged players some incentive to keep playing a little longer.

We summarize the rules for finding and playing the best slots:

1. The best paying slots, on the average, will be found in Nevada. Just picking any casino in the state and any slot in the casino will give you a shot at winning about 95% of your wagers. On the other hand, if you choose to play in Atlantic City, your average machine will pay you only about 91%. If you would like a different experience, try one of the Colorado casinos in the revitalized mining towns where slots are available. In any Colorado casino, the average machine will pay about 93% back. In Blackhawk, the dollar machines pay back an average of 94.5%.

2. Avoid playing in roadside locations, grocery stores, bars, airports and stateline locations. Never play illegal slots. Do play in casinos.

3. To use the Ladder Approach, described in the following chapters, only play Multipliers which offer the ability to play any number of coins without any penalty for playing less than the maximum number of coins. Option Multipliers (buy-a-pay) and Multiple Pay Line machines will be avoided. Of course, the pattern method of play, described earlier, can be played on any multiplier, even a progressive.

4. Play High Frequency Payoff slots. We want to play a machine that pays off frequently. Jackpot slots, including progressives and linked-progressives, such as Megabucks, will be avoided.

5. Avoid playing nickel slot machines as these machines are the tightest in the casinos. Play either quarter, dollar or $5 slots. We prefer to play the dollar machines, as the bankroll requirement is not excessive and the paybacks can be generous.

6. Never play two adjacent machines simultaneously. If you have found a loose machine, the machine next to it won't be.

7. Pick your spot in the casino carefully. Below are our rules for finding the highest paying (and avoiding the tightest) slots in the casino:

Machine to Play:

a. Slots outside the coffee shop.
b. Slots near the slots change booth.
c. Slots in visible locations in the slots area, such as in areas where slot aisles cross and on elevated carrousels.
d. At any highly visible location from the slot aisles.

Machines to Avoid:

a. Aisles of slots around table game areas.

b. Aisles that table game players use to get to the elevators or go outside.

c. Slots near show and ticket lines.

d. Slots near the sports book.

e. Slots highly visible from the table game area.

THE LADDER APPROACH

You should now have a good idea about the type of machine you will want to play and where it may be found.

Assume that you are on the Las Vegas Strip in one of the posher casinos. You have surveyed the casino and picked out a **Standard Five Coin Multiplier**, located at a junction of two slot aisles in a small group of four machines in plain sight of two slot banks. You have reviewed the pay schedule on the front of the machine, and it is not a jackpot machine; in fact, it shows a number of smaller payoffs. Based on everything you have learned from this book, you decide to play this slot.

You now face the decision of ***how*** to play this machine. You remember that this book emphasized that you pick out a machine which accepts multiple coins without penalizing you for playing less than the maximum number of coins on each pull. Now what do you do about it?

One of the most effective ways of playing any slot, which meets all of our other criteria, is **The Ladder Approach**. With this approach we will vary the number of coins we put in the machine per play, starting with a single coin and gradually

increasing the number of coins played until we reach the maximum number of coins accepted by the machine. In a sense, we will climb the "ladder" of coins invested in the machine by starting at the lowest rung and increasing our wagers as we move up the ladder.

We will set up this ladder of bets in such a way that a slot payoff paying ten, or in some cases twenty, times the amount of our wager, will result in a win for all coins invested prior to that win for this round of play.

Let's look at the pay schedule for the machine we have picked to play. Table 16 shows the pay schedule for this Standard 5 Coin Multiplier.

Table 16. Sample Standard 5 Coin Multiplier

Symbols	1 Coin	2 Coins	3 Coins	4 Coins	5 Coins
3C 3C 3C	100	200	300	400	500
2C 2C 2C	20	40	60	80	100
1C 1C 1C	10	20	30	40	50
Any 3 Cherries	2	4	6	8	10

C = Cherry
3C = Three Cherry Cluster
2C = Two Cherry Cluster
1C = One Cherry

Our basic pay schedule for this machine is 2—10—20—100 (shaded in table), which when multiplied by the number of coins played, expands to the full schedule shown above.

For this machine, we decide to devise a ladder such that any win of 10 times the coins inserted for that play will result in a net win for that round of play. Our ladder will consist of the following wagers:

The first nine wagers will be for 1 coin per play.
The next five wagers will be 2 coins per play
The next three wagers will be 3 coins per pull.
The following three wagers will be 4 coin wagers.
The final two bets will be 5 coin wagers.

Table 17 shows the effect that any win paying ten times the number of coins inserted will have on our investment for a round of play. You may think of 22 individual plays, or the number of plays needed to hit a 10x or greater payoff, as a round of play. Completion of a round of play (when a round requires 22 individual plays) requires inserting a total of 50 coins, as shown in the table.

The first column in Table 17 tracks the number of pulls or plays. The second column, "Coins," shows the number of coins inserted for each play. The third column "Total Coins," shows us the cumulative amount of our investment in this round.

Table 17. Ladder Winnings for 5 Coin Standard Multiplier, 10x Win

Pull	Coins	Total Coins	Any 10x Win	Minimum Win (10x)
1	1	1	10	9
2	1	2	10	8
3	1	3	10	7
4	1	4	10	6
5	1	5	10	5
6	1	6	10	4
7	1	7	10	3
8	1	8	10	2
9	1	9	10	1
10	2	11	20	9
11	2	13	20	7
12	2	15	20	5
13	2	17	20	3
14	2	19	20	1
15	3	22	30	8
16	3	25	30	5
17	3	28	30	2
18	4	32	40	8
19	4	36	40	4
20	4	40	40	-
21	5	45	50	5
22	5	50	50	-

The next column displays the amount, in coins, of any 10x win. The final column, "Minimum Win," tracks the minimum win that any 10x payoff will provide. We can see, for example, that if we hit on play 15, our net win for this round will be at least 8 coins. If we win on play 19, our net round win will be at least 4 coins.

Table 18 summarizes ten rounds played on this machine, using The Ladder Approach. The left hand column shows the round of bets, with

Table 18. Ten Rounds on Sample 5 Coin Multiplier — Ladder Approach

Game	Number of Pulls	Pulls to 10x Win	Net Won—Round	Net Lost—Round	Total Amount Won (Lost)
1	22			(32)	(32)
2	11	33	+7		(25)
3	22			(38)	(63)
4	15	37	+46		(17)
5	22			(40)	(57)
6	22			(44)	(101)
7	17	61	+38		(63)
8	13	13	+25		(38)
9	2	2	+18		(20)
10	14	14	+27		+7

each round consisting of either the number of pulls needed to hit a payoff of 10x or greater, or the number of pulls needed to complete a round of wagers. The second column, "Number of Pulls," is the number of pulls required to complete a round. In Game 1, we see that 22 pulls were required to complete the round. This means that no payoff of 10x or more occurred in 22 plays.

The third column, "Pulls to 10X Win," recaps the total number of pulls needed to hit a 10x or greater payoff. Starting with Game 1, we see that a payoff did not occur until pull 11 in Game 2, with a total of 33 pulls required (22 plays from Game 1 plus 11 plays from Game 2).

The next three columns show the amount won or lost for each round or game and the Total Amount Won or Lost throughout this session of play. Reviewing this column, we see that the most we were ever up was 7 coins in Game 10.

You may have wondered why we carried out the 4 and 5 coin wagers (see Table 17) to the point where a 10x would only break even. We did this because a number of lesser payoffs will typically occur in a round of bets, so that even if a 4 coin wager on pull 20 shows a break even situation in the table, it is likely that lower payoffs would have occurred by this point in a round of play so that we will have a net win.

If we analyze Game 7 shown in Table 18 we can illustrate this point. The payoffs in Game 7 were for 2, 4 and finally 60 coins, for total payouts of 66 coins. By the time we hit a 20x payoff on play 17, our investment was 28 coins, leaving a net win of 38 coins for the round. Even though we don't consider a round

of play completed when we receive lower payoffs, in this case 2 and then 4 coins, these payoffs certainly contribute to our overall winnings.

A net win of 7 coins with 160 pulls may not seem like much of a win. However, if we consider that 300 pulls per hour would not be considered fast play for a slot machine, then this win would be equivalent to about 13 coins an hour. On a dollar machine, if the machine continued to pay at about the same rate, we would win $13 an hour.

Wow, you say, "A whole 13 bucks an hour!" We admit that this is not much of a win rate for this machine. However, we did not hit the jackpot while playing this machine. We used our selection criteria to pick out a likely machine, which does not guarantee that every slot you play will be a winner. While we may sniff a little with disdain at a measly $13 an hour win, consider this: We invested half an hour in this machine, and while we didn't win much, **we didn't lose.** We have our original bankroll, plus a little more, so that we have not been hurt in our quest to find a better paying machine.

If we had played this same machine making flat bets, our results would have been considerably different. By "**flat bet**," we mean making the same wager over and over, regardless of what our payoffs are. When we played this machine, we recorded the results of every pull. This is not something you ever need to do, but we did it so that we could analyze the results of our play in some detail.

With the results of every play recorded, we could, in effect, go back over the same results and play them in a different manner, at least on paper. That's what we did with the session shown in Table 18. We "paper played" these same pulls making a wager of 1 coin per pull, and never varied the number of coins inserted for each play. Table 19 shows what this session looked like.

Table 19. Ten Rounds on Sample 5
Coin Multiplier — Flat Bets of $1

Games Played	Pulls to Win 10x Win or Greater	Total Coins Won	Total Coins Invested	Net Win (Loss) per Session
1—2	33	14	33	(19)
3—4	37	24	37	(13)
5—7	61	34	61	(27)
8	13	22	13	+9
9	2	20	2	+18
10	14	24	14	+10
Total				(22)

If we consider that we invested a total of 160 coins and lost 22 coins, our loss rate was 13.75%. If this loss rate were to hold, it would indicate a payback rate of about 86% for this slot machine. We can not make sweeping conclusions about a machine based on only 160 pulls. It may be set to pay only 83% or as high as 93%. We can probably conclude that it is a tight machine, and one that we don't want to continue playing.

Please note that no matter what our flat bets were, we would still have a loss playing this machine. If we played 2 coins per pull instead of 1 coin, our loss for this session would have been 44 coins. At 3 coins per pull, our loss would have been 66 coins. Even if we had hit the 100 coin payoff on this machine, our results using **The Ladder Approach** would still be superior to flat betting.

So much for the books that advise you to always insert the maximum number of coins. While the amount you win with a high payoff hit may be less using The Ladder Approach than if you were inserting the maximum number of coins per play, your overall winnings will nearly always be greater than with any flat wagering approach. And as we saw in this example, we were able to make a small profit on a tight machine, which preserved our bankroll so that we can look for greener pastures.

Let's try to find a better machine. We decide to move over just one machine, recalling that two adjacent machines are hardly ever looser machines and since the machine we just played was tight, we might have better luck at the next one. We look around. Our playing area is clearly visible from two banks of slots, and in addition is in a pathway used by many players going from this slots area to the change booth. It clearly fits our criteria as a location that a casino would pick to place some of the highest paying slots. So we decide, having survived a poorer paying slot in the right spot, that the next machine over might yield better results.

The new machine has three reels and is a **Standard 3 Coin Multiplier.** The basic pay schedule is a little more complicated than our previous machine, and pays off as follows for 1 coin inserted: **2—5—5—10—10—15—15—50.**

This machine will have a different ladder as it only accepts a maximum of three coins. We decide to again target a win of 10x or greater and to use the follows wagers for our ladder:

The first nine wagers will be for 1 coin per play.
The next five wagers will be 2 coins per play.
The final three wagers will be 3 coins per play.

Table 20 shows how this ladder works considering any win of 10x or greater our target win. In this case, we may play 17 individual plays to complete a round if no 10x payoffs occur. Completion of a round of play will require inserting 28 coins, as shown in the table.

The first column in Table 20 shows the number of plays. The next column, "Coins," indicates the number of coins to be inserted for each play. "Total Coins" indicates the total number of coins played in the round up to, and including that particular play. For example, when we have completed Pull 13, we will have played 17 coins. The "Any 10x Win" column recaps the minimum amount of an individual win we will consider to call a round completed. The last column shows the minimum win we will have accumulated in a round when a 10x or greater payoff occurs. As you will recall, we call this our minimum win, as any lower payoffs which will hit in a round will increase our total winnings

for that round to an amount greater than the amounts shown in the table.

Table 20. Ladder Winnings for 3 Coin Standard Multiplier, 10x Win

Pull	Coins	Total Coins	Any 10x Win	Minimum Win (10x)
1	1	1	10	9
2	1	2	10	8
3	1	3	10	7
4	1	4	10	6
5	1	5	10	5
6	1	6	10	4
7	1	7	10	3
8	1	8	10	2
9	1	9	10	1
10	2	11	20	9
11	2	13	20	7
12	2	15	20	5
13	2	17	20	3
14	2	19	20	1
15	3	22	30	8
16	3	25	30	5
17	3	28	30	2

Now that we have our approach figured out, let's play this machine. Table 21 shows the results of ten rounds of play on this machine. A round of play consists of the number of pulls needed to hit a 10x or greater payoff, or to complete all seventeen wagers in the ladder of bets. We have called each round of play a "Game" in this table. The column, "Number of Pulls," shows the total number of pulls required to complete a Game, either by hitting a 10x or greater payoff, or through completing all the wagers in the ladder.

We hit wins of 10x or greater five times in this session. Our first win occurred in Game 1 after only 9 pulls. The next 10x win happened in Game 4, with 45 pulls made between the first and second win. Twelve pulls later we hit again. This win was followed by another dry stretch, with 41 pulls required to hit the next big one in Game 8. Finally, another 28 pulls were needed to hit our final 10x or greater win and wrap up the session.

Table 21. Ten Rounds on Sample
3 Coin Multiplier—Ladder Approach

Game	Number of Pulls	Pulls to 10x Win	Net Won—Round	Net Lost—Round	Total Amount Won (Lost)
1	9	9	+13		+13
2	17			(4)	+9
3	17			(9)	-0-
4	11	45	+17		+17
5	12	12	+31		+48
6	17			(10)	+38
7	17			(5)	+33
8	7	41	+7		+40
9	17		+4		+44
10	11	28	+25		+69

This session turned out much better than the session on the first machine. We won 69 coins in 135 pulls. Assuming that our playing rate is about 300 pulls per hour, then this win is equivalent to a win rate of 153 coins per hour. Since this was a dollar machine, our winning rate was $153 an hour. Now we are starting to see some progress!

We know that this machine is producing much better than the first one, but just how much better? We decided to run through the exact same payoffs, using flat wagers so that we can compare The Ladder Approach with flat betting.

Table 22 recounts our experience replaying the same pulls (through the magic of paper and pencil). This table reflects the results of playing a dollar a pull, for the same 135 pulls with the same payoffs.

Table 22. Ten Rounds on Sample 3 Coin Multiplier—Flat Bets of $1

Games	Pulls to Win 10x Win	Total Coins Won	Total Coins Invested	Net Win (Loss) per Session
1	9	22	9	+13
2—4	45	47	45	+2
5	12	27	12	+15
6—8	41	41	41	-0-
9—10	28	41	28	+13
Total				+43

In this case our return with flat betting was positive. With a 43 coin profit for 135 pulls, our winning rate was over 30%! Now we know that no slot machines are programmed to pay over 99%. This is an example of what can happen on a short-term basis with a better paying slot machine. Unless this session was a fluke (and subsequent games on the same machine proved that it wasn't — we won consistently), this is the machine we are looking for. We probably have a 98—99% payback slot with this machine.

So, our patience has paid off.

This is an excellent method for short-term slot play. As we saw, when we played the first machine, it tends to hold its own even against some of poorer paying Standard Multipliers.

To use this method is very simple. Your first step is to find a suitable machine to play. If you have followed our guidelines, you will not find that this it too difficult. Especially in Nevada, you will find a variety of casinos and variety of slots "programmed" to pay out frequently on lower paying payouts.

After finding a suitable machine, you will apply a ladder. We have had some luck with 20x ladders, but in general, the 10x approach will offer superior results. In using a 10x ladder, the only decision you have to make depends on the number of coins accepted by the machine. We generally stick with three and five coin multipliers, and you should too. For any Standard Five Coin Multiplier, the ladder you will use is:

Table 23. Ladder for Five Coin Multiplier — 10x Target

Coins Per Play	Number of Plays	Coins Risked
1 Coin	9	9
2 Coins	5	10
3 Coins	3	9
4 Coins	3	12
5 Coins	2	10
Totals	22	50

If the machine you select is a **Standard Three Coin Multiplier**, then you will use the ladder shown in Table 24.

Table 24. Ladder for Three Coin Multiplier — 10x Target

Coins Per Play	Number of Plays	Coins Risked
1 Coin	9	9
2 Coins	5	10
3 Coins	3	9
Totals	17	28

In the case of the five coin machines, your risk per round will be limited to 50 coins; with the three coin multipliers, your risk is only 28 coins per round. We have had good results with both types of machines, but because of the lower investment per round, I have a preference for the three coin multipliers.

The Ladder Approach works on three reel as well as five reel slots. Seeking more simplicity in my life, I prefer the three reel machines, although our results have not varied significantly playing the five reel machines. With microprocessor controlled machines, it is possible for the three reel machine to have more possible combinations that a five reeler, and even though I know this, I still prefer the three reel slots.

After selecting the machine you want to play and picking out the appropriate ladder, you start playing. After any win of 10x or greater, the round is over. It is not necessary to memorize anything to use this method. All you have to remember is the correct ladder, and this information can be written on a piece of paper you carry with you.

I recommend that you separate the number of coins needed to play a round, 50 coins for the five coin machines, and 28 coins for the three coin slots. After a round is completed, either by hitting a 10x payoff or by playing through all of the wagers without a qualifying hit, you should count the number of coins and record the results for that round. By doing this, you will be able to qualify the machine to determine if you wish to continue playing it.

I generally play ten rounds on a machine, unless the first few rounds are very poor producers. As you have seen in the results of play presented in this chapter, it is not uncommon for a loose machine to have two or even three losing rounds in a row (look at Table 21 again). The critical factor in evaluating a machine is the size of the losses. If the losing rounds have minimal losses, then it is usually "safe" to continue playing a machine. If the losses start to mount, I usually retreat and find another machine. With all of the good paying machines available, you don't want to find yourself chained to a poor producer.

Recording the results of your play does not have to be elaborate. Just write down the round number, as in "round 1," and record the number of coins you are up or down for the round, like "+6." After a few rounds you will began to see a pattern, and after ten rounds you will definitely know whether you want to continue playing this machine.

A word of caution. The Ladder Approach is an effective method of play and will protect your bankroll against a major hit only on the Standard Multipliers. It is not effective against the Jackpot machines, against the linked progressives or against the

Option machines, which do not pay on all symbols unless the maximum number of coins have been inserted. Use of the system with these machines may be harmful to your bankroll!

The Ladder Approach is very effective. However, I use it primarily to evaluate machines. If you decide to make it your exclusive method of play, you shouldn't do too badly with it. There is a more powerful method of play, which builds on the ladder approach. We will next explore this even more powerful method for beating the slots.

CYCLE TESTING SLOTS

The Ladder Approach works fairly well because it reduces the size of the average wager, while it attempts to increase the amount wagered and therefore the amount won, for winning wagers.

The relative effectiveness of this simple method of play brings to mind the question, "Do slots pay off on more or less regular cycles?"

We know that the microprocessor equipped slots have as their heart a Random Number Generating program, which ensures that the programmed payoffs will over the long-term provide a predictable payout.

We sense, seeing the results that a simple laddering structure produces, that there may be some predictability to the microprocessor controlled payoffs.

Let's assume that we are playing a simple coin tossing game where the possible outcomes are head, tails and "coin on edge." We will lose when either a heads or tails shows and win whenever the coin lands on edge. We know that this game is set

up so that the house will pay out 99% of the coins wagered and that an "on edge" toss will pay out nine coins for each one played. We can also reason, that if the 99% payout is correct, the "on edge" situation will occur, on the average, 11 times in 100 tosses.

We reach this conclusion by analyzing how the outcomes must occur in order for the house to pay out 99% of the amount wagered. Table 25 shows the average distribution of coin tosses, so that the house payback of 99% will be maintained:

Table 25. Distribution of Coin Tosses — 100 Tosses

Outcome of Toss	Number of Tosses	Payouts in Coins
Losing Wager — Heads or Tails	89	-0-
Winning Wagers — On Edge	11	99
Total Tosses	100	99
Average Number of On Edge Tosses	100 Coin Tosses/11 **On Edge** Tosses = 9.09 Frequency of **On Edge** Tosses	

We can see from the simple analysis in Table 25 that we would expect an On Edge Toss to occur every 9.09 tosses or about 11% of the time. Now we have the basis for a betting system. Since the rules of this game allow us to wager from one to three coins on each coin toss, we decide to wager only one coin for eight wagers, and then every ninth wager increase our bet to three coins. We reason that by wagering in this manner, we will be betting only the minimum amount (the rules require that you must

wager every bet in order for the game to continue) when the game is programmed to take our money, and we will be wagering the maximum amount when the payoff is expected to occur.

Alas, this betting approach turns out to be a disaster. We try this system for a total of 88 coin tosses and manage to win only one of our three coin wagers! Here's the distribution of winning wagers in 88 coin tosses:

Number of tosses to winning wager
9
7
12
6
10
21
11
12

We decide to analyze the outcome of these 88 coin tosses more carefully. We total the number of tosses required to make each winning wager and divide this number by the number of winning wagers (88/8) to compute that, on the average, a winning wager occurred every 11 tosses. Please note that for this session of coin tossing a winner showed up less frequently than we would expect (the expected frequency of a winner is once every 9.09 tosses or rounded, every 9 tosses). Even if we had made our large wager every eighth, ninth and tenth coin toss, we would have won only two times in 88 tosses!

Our problem in using the average number of tosses to time our largest wager is that while a winner shows on the average of every nine coin tosses, this is only an average. As we saw in our test of 88 coin tosses, while a winner appeared eight times in 88 tosses, only once did the winning wager happen to be on the ninth toss, even though a win occurred, on the average, once every 11 tosses.

Our idea of putting more money down when a winning coin toss is more likely to hit may be sound, but our methodology needs to be improved. Fortunately, the discipline of statistics has come up with an approach to help us. In analyzing the results of our coin toss game, we have been concentrating on the arithmetic average, also known as the **mean**. This gives us a starting point in our quest to know when to raise our wagers, but what we really need to know is "how spread out are our winning hits," rather than only knowing when they occur on the average.

A statistical measure for determining how much variability or spread we have in the average number of tosses to achieve a win, is called the **Standard Deviation.** The Standard Deviation measures the variability of the numbers which make up the average or mean. If we knew just how variable the spread of hits about the mean was, we could adjust our betting approach so that we would know when it was about time to increase our wagers with some reasonable expectation that the probability of a winning toss was eminent.

The Standard Deviation does just that. Statistics teaches us that when we have a set of data which approximates a **Standard Normal Distribution** (a special term indicating that the data will

tend to group more heavily about the mean and to appear less frequently as we deviate more and more from the mean) and if our data confirms to this standard (and we have every reason to believe that our sample data does just this), then we can compute the Standard Deviation for this data and determine just how likely a given score is to be within a certain percentage of the average of all of our scores.

Statistical evidence indicates that over two thirds of all scores of a normal distribution will fall within one standard deviation of the mean. Think what this means. If we knew the standard deviation for the coin tossing game, then we could group our larger wagers within one standard deviation of the mean and count on winning this larger wager over two thirds of the time.

To compute the standard deviation for a sample of data looks more difficult than it really is. The formula for computing the standard deviation for a sample is:

$$s = \sqrt{\sum (x - \bar{x})^2} \quad / n - 1$$

Where,
Σ stands for the summation of data,
x represents each item of data,
$\bar{x}$ is the average (mean) of the sample of data,
n is the number of items of data, and
s is the statistical representation for the standard deviation for a sample.

To solve for **s,** the standard deviation of our sample of the number of coin tosses per winner is surprisingly simple. One way to solve a problem like this is to set up the required calculations in a table form. Table 26 shows how the problem can be set up.

Table 26. Calculation of Standard Deviation for Coin Tosses

Tosses to Win **x**	**Tosses - Average** $x - \bar{x}$	**(Tosses - Average)²** $(x - \bar{x})^2$
9	-2	4
7	-4	16
12	+1	1
6	-5	25
10	-1	1
21	+10	100
11	-0-	-0-
12	+1	1
88	-0-	148

We first calculate $\bar{x}$, the sample mean, by dividing the total of Tosses to Win by the number of wins, for 88/8 = 11.0. The left column in Table 26 shows the raw scores, which represent the values of **x**. In the second column, $x - \bar{x}$**,** we calculate the values of each raw score less the mean. For example, the first value in the second column was derived by the equation 9 - 11 = -2. In the third column $(x - \bar{x})^2$, the values in the second column are squared. The first value in column three is $-2^2 = 4$ (a negative number squared is always a positive number). After the values in column three are computed, this column is totaled, for a total of 148.

We now have everything we need to know to solve for the Standard Deviation except the value of **n**. This value is simply the number of items we have in column one, in this case 8 items. Since our formula calls for using **n - 1** as the divisor, this value is 8 - 1 = 7.

Substituting our calculated values, our equation now becomes
s = √148/7 = 4.598.

There is a much easier way to make these calculations. Many of the electronic hand held calculators can calculate the value of s. The calculator I use is the Texas Instruments TI-30SLR+ which costs less than twenty dollars. To calculate **s** is very simple. The steps are:

Clear Stat Register	2nd CSR
Enter Data Set	
	9 Σ+
	7 Σ+
	12 Σ+
	6 Σ+
	10 Σ+
	21 Σ+
	11 Σ+
	12 Σ+
Calculate Mean	2ndx
Calculate s	2nd σ_{n-1}

On this particular calculator, the symbol "σ_{n-1}" means the same thing as "s."

While these calculations may seem tedious, they are very easy to do with the calculator.

We now have computed the values of $\bar{x}$ and **s** for our coin tossing data. We now want to develop a betting series so that we will be wagering the most money when the coin is most likely to land on edge, and wager lesser amounts when we are more likely to lose our wagers.

We first want to reexamine our data. Experience has shown us that any scores which are too far from the mean will tend to exaggerate any values calculated with these scores included in the data. Scores which are more than the value of one standard deviation above the mean are especially suspect, so we will want to exclude any values which are greater than the value of $\bar{x}$ **+ s**. Substituting the values we have calculated into this equation, we have $\bar{x}$ **+ s** = 11.00 + 4.598 = 15.598 = 15.60 (rounded).

Looking at our original data, we see that we have one value, that of 21, which is greater than 15.60. We now exclude this value from our data and recompute the mean **(** $\bar{x}$ **)** and the standard deviation **(s)** with our modified data. The modified data and the amounts calculated for $\bar{x}$ and **s** are:

Modified Data:

9
7
12
6
10
11
12

Value of $\bar{x}$ for Modified Data = 9.57
Value of **s** for Modified Data = 2.37

Using these new values of the mean and standard deviation, we will now devise a range for betting $1, $2 and $3 which are the only wagers allowed in the coin toss game.

We will want the $1 wagers on bets where the number of tosses are less than one standard deviation below the mean.

We will want to bet the largest amount of $3 on tosses where the number of tosses is greater than one standard deviation below the mean and less than or equal to one standard deviation above the mean.

We will wager $2 on bets where the number of tosses is greater than one standard deviation above the mean, but no more than two times the average modified mean.

Using the values derived from the modified data, we have:

Range($1 Wager): R1 = 1 ≤ ($\bar{x}$ - s); R1 = 1 ≤ 9.57 - 2.37; R1 = 1 ≤ 7

Range($3 Wager): R2 = R1 + 1 ≤ **(** $\bar{x}$ + s); 8 ≤ (9.57 + 2.37); 8 ≤ 12

Range($2 Wager): R3 = R2 + 1 ≤ (2 $\bar{x}$ **)**; 13 ≤ 18.

So our range of wagers is as follows:

Wager $1 on tosses 1 through 7, then
Wager $3 on tosses 8 through 12, then
Wager $2 on tosses 13 through 18.

The purpose of this betting scheme is to make our largest wagers when the number of tosses is within one standard deviation of the mean, to wager the least amount when the number of tosses is less than one standard deviation below the mean and to wager a medium amount whenever the number of tosses is greater than one standard deviation above the mean, but less than double the sample mean.

We use this wagering structure to maximize the probability that any wins will be on wagers for the largest amount, and most losing wagers will hopefully be for lower amount wagers.

One way to test this approach is to play three versions of the coin toss game against the data we have recorded and to compare the results. We will play a flat bet game, where we never vary the size of our bets, a Ladder Approach game, and finally, we will apply what we have learned analyzing the data to play a game using the results of our cycle analysis.

If we "replay" the coin toss decisions making only flat wagers of a $1 a toss, our results are not very good. We recall that a winner showed up only once every eleven tosses on the average, which is less than our expected average of about once every nine tosses. In other words, we had a series of coin tosses where the house won slightly more than its fair share. This type of variation is common to all games of chance and is the basis of many players proclaiming after a session which deviated more in the house's favor, that they were "unlucky." If they were fortunate enough to hit a streak where the wins occurred more frequently than would be expected, many players would feel like they hit a "lucky" streak.

Since we know that we did not get as many wins as we might expect on the average, we are not surprised to learn that with flat betting of $1 a toss, we managed to lose $16 in this contest. Table 27 recounts the results of flat wagering against these coin tosses.

Table 27. Results of Betting $1 a Wager in Coin Toss Game

Tosses to Win	Amount Won	Amount Invested per Win	Net Amount Won for Each Winning Wager
9	+9	9	-0-
7	+9	7	+2
12	+9	12	-3
6	+9	6	+3
10	+9	10	-1
21	+9	21	-12
11	+9	11	-2
12	+9	12	-3
	+72	88	-16

If we had decided to make $2 wagers, we would have lost $32. With $3 flat wagers, our losses would have been $48. There is no way that we can overcome the house edge in a negative expectation game with flat betting. The house edge on this particular series of tosses can be determined by dividing the amount lost by the amount invested for 16/88 = 18.18%. We can see in this example how a game with only a one percent theoretical advantage can extract a much higher percentage from our wallets in a given session.

We decide to try The Ladder Approach. We work out the calculations for a 9x winning wager and come up with the following ladder:

Wager $1 for the first eight tosses
Wager $2 for the next four tosses
Wager $3 for the final three tosses

After the fifteen tosses in our ladder, if no win occurs, we will start over and continue laddering our bets until we have a win. Anytime we have a win (any win in this game is worth 9 x the wager), we will start the ladder over.

Table 28 shows the results of using The Ladder Approach with the same series of coin tosses.

Table 28. Results of The Ladder Approach in Coin Toss Game

Tosses to Win	Amount Won	Amount Invested per Win	Net Amount Won for Each Winning Wager
9	+18	10	+8
7	+9	7	+2
12	+18	16	+2
6	+9	6	+3
10	+18	12	+6
21	+9	31	-22
11	+18	14	+4
12	+18	16	+2
	+117	112	+5

With The Ladder Approach, we were able to win $5, with an investment of $112, for a winning rate of 4.46% (5/112 = 4.46%). This is a tremendous improvement over flat betting, and remember that these results were achieved playing a session where the house edge was over 18%! There is no question that laddering the wagers can protect us from losses and even seem to perform the impossible at times, as in this instance of producing a win against terrible odds.

How well would we do if we used our Cycle Approach to betting this series of coin tosses? The Cycle Approach betting series is:

Wager $1 on tosses 1 through 7, then
Wager $3 on tosses 8 through 12, then
Wager $2 on tosses 13 through 18.

Table 29 shows the results of applying the Cycle Approach to the coin toss game. We won $20 playing the same series of tosses that resulted in the $1 flat bettor losing $16, and The Ladder Approach player winning $9. If we compare the amount we wagered in the Cycle game of $142 with the amount won of $20, we find that by using a betting cycle we were able to improve of winning rate to 14.08% (20/142 = 14.08). This is absolutely remarkable for a game which short changed us to the extent of an 18% house advantage.

Table 29. Results of Cycle Approach in Coin Toss Game

Tosses to Win	Amount Won	Amount Invested per Win	Net Amount Won for each Winning Wager
9	+27	13	+14
7	+9	7	+2
12	+27	22	+5
6	+9	6	+3
10	+27	16	+11
21	+9	37	-28
11	+27	19	+8
12	+27	22	+5
	+162	142	+20

We began this chapter by asking the question, "Do slots pay off on more or less regular cycles?" We approached this question by examining a hypothetical coin toss game, which only paid off about every ninth toss when the coin landed on edge. We examined some data generated by the coin tossing, with the data examined representing a poorer set of results for the player, as a winner appeared, on the average, every eleven tosses rather than every nine tosses. We compared several approaches to playing the coin toss game, with an emphasis on changing the amount wagered in response to the likelihood of a winning toss showing.

As may have occurred to you, the similarity between the coin toss game, where most tosses resulted in a loss, and a slot machine, where most pulls offer no payback, is not accidental. Our coin toss game was purposefully designed to mimic a slot machine programmed to pay back a high return to the player, with fairly frequent payoffs of about 10 to one. The results of playing the coin toss game are directly applicable to playing slot machines. We used the coin toss illustration because in having only one payoff, it simplified our testing of alternative approaches to playing the game. However, the results of our testing are directly applicable to the playing the appropriate high payback, high frequency Multiplier slot machine.

The results of our testing should prove most instructive. Table 30 recounts the results of our comparison of playing methods.

Table 30. Comparison of Flat Betting, The Ladder Approach and Cycle Betting in Coin Toss Game

Betting Method	Investment in Game	Total Return	Net Won or Lost	Return %
Flat Betting - $1	88	72	-16	-18.18%
Flat Betting - $2	176	144	-32	-18.18%
Flat Betting - $3	264	216	-48	-18.18%
Ladder Approach	112	117	+5	+4.46%
Cycle Betting	142	162	+20	+14.08%

A comparison of our results in quite interesting. Looking first at any of the Flat Betting schemes, whether we wagered $1, $2 or $3 per toss, we managed to lose 18.18% of the amount wagered. Even wagering only $1 a toss cost us $16 in this session. We might conclude that flat betting the minimum wager may allow us to lose more slowly. But why accept such dismal results?

The Ladder Approach offers us a better approach than flat betting, with a positive return of 4.46% earned with this method. The average size of the Ladder wager was $1.27, computed by dividing the Investment in Game by the number of tosses (112/88 = 1.27). With laddering our wagers, our average wager was only slightly higher than making $1 flat bets, but our results were much improved.

Cycle betting improved our results even more. With the Cycle Approach, we were able to earn $20 on the same tosses that produced losses with flat betting and gave us an $5 win with laddering. We invested a total of $142 in this game with cycling, for an average wager of $1.61 (142/88 = 1.61). Our return improved to 14.08% of the amount wagered, on a series of wagers where the house had an edge of over 18%.

In comparing Cycle Betting with Laddering, we can see that our average wager of $1.61 was somewhat larger with the Cycle Approach than the average wager of $1.27 in The Ladder Approach. This occurred because our cycle betting series entailed concentrating larger wagers at the times in the cycle of coin tosses when a win was more likely to hit.

"Do slots pay off on more or less regular cycles?" As we shall see in the next chapter, some do. And the Cycle Approach helps us to beat these slot machines.

WINNING WITH CYCLE BETTING

We now want to apply what we have learned to playing slot machines. We will compare the approaches of Flat Betting, The Ladder Approach and Cycle Betting to the Standard 3 Coin Multiplier which was used as an example in the chapter "The Ladder Approach."

When we were first testing play on this machine, we decided to target a 10x payoff as our target win for each game, and we noted the following number of pulls needed before we hit a win paying 10x or more:

Number of pulls to winning wager
9
45
12
41
28

With these results we decide to analyze these slot machine pulls. We first add up the total number of pulls and then compute the average number of pulls. The total number of pulls was 135, if

we divide this by the number of target wins, we have: 135/5 = 27 = $\bar{x}$. Setting up our table to compute the Standard Deviation, we derive the amounts shown in Table 31.

Since there were 5 wins, the value of **n** is 5 and **n** - 1 = 4. Column one (**x**) in the table represents the number of pulls to win a slot payoff of 10x. The second column x - $\bar{x}$ has amounts computed by subtracting the value of $\bar{x}$ from each of the numbers of pulls to win, as in 9 - 27 = -18, the first derived amount in the second column. Values in the third column, **(** $x - \bar{x}$ **)²**, were derived by squaring each of the values in the second column.

Table 31. Calculation of Standard Deviation for Standard 3 Coin Multiplier

Pulls to Win **x**	**Pulls - Average** $x - \bar{x}$	**(Pulls - Average)²** **(** $x - \bar{x}$ **)²**
9	-18	324
45	+18	324
12	-15	225
41	+14	196
28	+1	1
135	-0-	1070

Having computed these values, we substitute the values into the equation for standard deviation for s = √1070/4 = 16.355.

If we use the calculator (Texas Instruments model TI-30SLR+) we have:

Clear Stat Register	2nd CSR
Enter Data Set	9 Σ+
	45 Σ+
	12 Σ+
	41 Σ+
	28 Σ+
Calculate Mean	2ndx
Calculate **s**	2nd σ_{n-1}

Remember that on this particular machine, σ_{n-1} is equivalent to **s**. Having performed these calculations, we want to reexamine our original data and see if any of the values are greater than the value of x **+ s**. Substituting our calculated values, we have $\bar{x}$ **+ s** = 27.0 + 16.355 = 43.355 = 43.40 (rounded).

Reexamining our original data, we compare the values with 43.40 and we see that one value, that of 45 exceeds 43.40. We will modify our original data by excluding this value and recompute $\bar{x}$ and **s**. The modified data and the values computed for $\bar{x}$ and **s** are :

Modified Data:

9
12
41
28

Value of $\bar{x}$ for Modified Data = 22.50
Value of **s** for Modified Data = 14.89

Using the modified values of the mean and standard deviation, we can compute our betting ranges for this 3 Coin Standard Multiplier.

We will wager only $1 when the number of pulls is less than one standard deviation below the mean number of pulls to hit a 10x win.

We will wager $3 when the number of pulls is greater than one **s** below x and less than one **s** above $\bar{x}$.

We will wager $2 when the number of pulls is greater than **s** + $\bar{x}$, but less than 2x.

Using our values calculated from the modified data, we have:

Range($1 Wager): R1 = 1 ≤ ($\bar{x}$ - **s**); R1 = 1 ≤ 8.

Range($3 Wager): R2 = R1 + 1 ≤ ($\bar{x}$ + **s**); R2 = 9 ≤ (22.50 + 14.89); R2 = 9 ≤ 37.

Range($2 Wager): R3 = R2 + 1 ≤ (2 $\bar{x}$); R3 = 38 ≤ 45.

We are now in position to "play" against the recorded decisions on our standard 3 coin multiplier, and to compare the results of flat betting, The Ladder Approach and Cycle Betting.

Let's first try flat betting making wagers of $1 a pull. Table 32 shows the results of flat betting against this series of slot pulls. This was an extraordinarily good series of slot pulls. The house

edge on this particular series of pulls can be computed by dividing the amount won by the amount invested for 43/135 = 31.85%. This is a good example of what we might call a "lucky" streak. We know that with flat betting, any house edge on a given series of wagers will cause a loss, and in this case, playing with

Table 32. Results of Betting $1 a Wager with Standard 3 Coin Multiplier

Pulls to Win	Amount Won	Amount Invested per Win	Net Amount Won for Each Winning Wager
9	+22	9	+13
45	+47	45	+2
12	+27	12	+15
41	+41	41	-0-
28	+41	28	+13
	+178	+135	+43

almost a 32% advantage over the house, we did well with flat betting. We know that using The Ladder Approach and the Cycle Approach we did well on our coin toss series which resulted in a loss for the flat bettor. How will these approaches hold up in a series of wagers where we have had the best of it?

We will try The Ladder Approach first. As you may recall, our ladder for this particular 3 coin multiplier is:

Wager $1 for first nine pulls
Wager $2 for next five pulls, then
Wager $3 for final three pulls.

After 17 tosses in our ladder, if no win occurs, we will start over and continue laddering our bets until we have a win. Anytime we have a win of 10x or greater, we will start the ladder over.

The payoffs offered by this particular slot are: 2-5-5-10-10-15-15-50. We will consider a series of wagers completed whenever our win is for at least 10 times the amount wagered. Table 33 shows the results of using The Ladder Approach with our series of slot pulls. The Ladder Approach produced a win of $69, with an investment of $197, for a winning rate of 35.02% (69/197 = 35.02). Notice that in this case laddering produced only a slightly higher rate of return than flat betting. Flat betting may produce a percentage return almost as high as laddering whenever a series of wagers shows a positive return for the player, as was the case here, where we enjoyed a positive return of about 32%. As we noted with the coin toss game, whenever a series of wagers results in the house retaining an edge over the player, The Ladder Approach nearly always shows a much higher return than flat betting. Even though the percentage return for Flat Betting was almost as high as laddering in this instance, laddering bets still produced a much higher dollar return, the measure most players are interested in.

Table 33. Results of The Ladder Approach with Standard 3 Coin Multiplier

Pulls to Win	Amount Won	Amount Invested per Win	Net Amount Won for each Winning Wager
9	+22	9	+13
45	+73	69	+ 4
12	+46	15	+31
41	+55	63	- 8
28	+70	41	+29
135	+266	197	+69

If we take the same sequence of pulls and apply the Cycle Approach, our results are even more improved. Table 34 summarizes the result of using Cycle Betting against these slot machine pulls. With bet cycling, the results are quite good. We won $127, playing the same series of slot pulls that resulted in a $43 win with flat betting, and a $69 win using The Ladder Approach. Our investment in this sequence of wagers was $314, with total winnings of $441. Our winning rate was 40.44% (127/314 = 40.44), for a greater than fifteen percent improvement over laddering. While this improvement in percentage won is not earth shattering, the dollars won of $127 were 84% higher than the amount won with laddering and 195% greater than the amount won with flat betting.

With continued testing and comparison of these three approaches, we have concluded that the greatest percentage improvements, comparing The Ladder Approach and Cycle Betting with Flat Betting, result whenever a sequence of slot pulls produces a negative expectation for the player, that is, when the player is experiencing what he might term an unlucky streak.

On those occasions when a sequence of slot pulls is positive for the player, flat betting may produce a return almost as high as laddering, but laddering and cycling will nearly always show larger dollar returns. In the two examples examined in this and the previous chapters, Cycle Betting beat both flat betting and laddering both in terms of dollars won and the percentage returned on the amount wagered.

With all slot machines programmed to offer less than a positive return to a player, sequences with negative expectations for the player are more common than positive ones. Faced with this fact, the flat bettor is doomed to lose while the ladder player, and to a greater extent, the cycle bettor, will have good opportunities of winning.

Table 34. Results of Cycle Approach to Standard 3 Coin Multiplier

Pulls to Win	Amount Won	Amount Invested per Win	Net Amount Won for each Winning Wager
9	+52	11	+41
45	+107	110	- 3
12	+65	20	+45
41	+100	105	- 5
28	+117	68	+49
135	+441	314	+127

Notes to Table 34:
Plays 1-8, Bet 1 coin
Plays 9-37, Bet 3 coins
Plays 38-45, Bet 2 coins

Table 35 compares the results of the three methods of play when applied to a Standard 3 Coin Multiplier. You will notice that in this particular sequence of slot pulls, playing $3 a pull would have produced the highest dollar return of $129. However, an investment of $405 would have been required to earn this, and even more importantly, we are using the benefit of hindsight to make this determination. As we have seen, flat betting will lose whenever a series of slot wagers results in a negative expectation for the player, while laddering and cycling both provide opportunities of winning.

In this comparison, Cycle Betting again emerged as the clear winner. While laddering offers us a simple way to significantly out perform the flat bettor, the little additional time required to determine a slot's cycle is well worth the effort and can result in large improvements in your winnings.

I hope that the mathematics used to determine a betting cycle has not been too tough for you. I urge you to invest twenty bucks in a statistical calculator so that you can start using cycle betting to improve your slot winnings. I have found that cycle betting, when coupled with the slot selection process we have discussed in this book, are tried and true combinations to produce very good and fairly consistent winnings on the slots. A little investment in time to learn these procedures will pay you back many times over.

Table 35. Comparison of Flat Betting, The Ladder Approach and Cycle Betting Playing Standard 3 Coin Multiplier

Betting Method	Investment in Game	Total Return	Net Amount Won	Return %
Flat Betting - $1	135	178	43	31.85%
Flat Betting - $2	270	356	86	31.85%
Flat Betting - $3	405	534	129	31.85%
Ladder Approach	197	266	69	35.02%
Cycle Betting	314	441	127	40.44%

MONEY MANAGEMENT

The Super System of winning at slots requires that you pick the best machine in the right locale, test the machine using The Ladder Approach, analyze the results, set up a Betting Cycle and start playing using the Cycle Approach. In addition, to become a Super Winner, it is necessary that you use a planned, methodical approach to money management.

A typical gambler will play slots, or any other casino game, with whatever money he happens to have at the moment. He will not keep any records of his wins or losses, and he will typically continue playing until all of his money is gone. Many times, after this sad event, the gambling funds are augmented by advances on the credit card, or other monies that should not be spent gambling and the final results are pretty much the same. He goes home after a couple of days of gambling, tired, broke, discouraged and none the wiser as to how this happened other than he had "bad luck."

You are going to be different. If you have gotten this far in this book, then you know that winning is more than blind luck. You have been introduced to a superior system for playing slot machines, one that far outperforms any other slot system available. So now you think you've got it made.

Learning the Cycle Betting Approach to winning at slots is only half of the battle you face when you decide to engage in combat with a casino. The biggest obstacle you face in emerging from the casinos victorious (and by that we mean with more money than you came in with) is yourself.

The first obstacle you must overcome is deciding what it is that you want out of playing slot machines. Most people will say that they want to win, or if they are less honest, they will state that they play for fun. You have got to be in a much more focused frame of mind than your fellow gambler. Not only must you want to win, you must be determined to take all of the necessary steps to become and remain a winner. You will not play harder than other gamblers, you will play smarter.

This process of overcoming your own obstacles to success will begin by planning and controlling the amount of money you bring and play with in a casino. Your slot money, or bankroll, will not be whatever amount you happen to have when you walk in a casino. You will know in advance of your visit how much money you will need for playing the slots, and you will adhere to a set of rules to protect this money. Your slot bankroll will be designated for only that: **Slot Machine Play.** You will not use this money for meals, taxis, lodging, shows, or other non-slots activities. Your slots bankroll will be kept separate and apart from your other money, and you will keep a running record of your successes and failures at slots play, so that you always know exactly where you stand. If this sounds like a lot of work, it isn't. It is easy, and I dare say fun. Nonetheless, it does require more discipline than you are probably used to, but the proof is in the bottom line. If you practice correct money management, as well as the other

disciplines we have discussed, you will fall into the exclusive and highly limited group of astute individuals who actually manage to beat the slot machines.

Let's start with your Slots Bankroll. Your Bankroll is the amount of money that you bring to a casino for the express purpose of gambling. The time to decide on the amount you need and to assemble it is at home, before stepping into a casino. If you are short of the amount required, your best alternative is to wait until you have the correct bankroll. If you don't, then your play will be adversely affected, as you will be playing "short and scared" which is another way of saying that fear of losing your bankroll will tend to overshadow your playing to the extent that you will probably end up doing the very thing you fear: losing your bankroll.

The amount of your bankroll depends on the length of time that you plan on playing and the planned intensity of your play. If you plan on two days of fifteen hours a day slot play, then you will need a larger bankroll than a person planning a one day visit with a couple of hours of slots play. You know your own playing style. I personally feel that fifteen hours a day is way too much slots play for me; on the other hand, only playing for one two hour session would leave me feeling unfulfilled.

In addition to your playing style, the denomination of slots that you decide to play will determine your bankroll as well as your "gambling comfort level." Stated simply, some folks are only comfortable playing on quarter slots, while others prefer the $5 slots. I personally like dollar slots, as they are within both my budget and my gambling comfort level. I can play on dollar slots,

knowing that I may occasionally lose, and the size of the potential losses does not prevent me from enjoying the experience. If you are playing above your comfort zone (another way of saying above your head), then your fear of losing will color the whole experience and you will probably end up losing because you do not play properly.

Because of the variety of styles of play and the range of comfort levels, you must decide on the size of bankroll that you will need. One more factor comes into play in making this decision, and that is whether you will be playing on three or five coin multipliers. Play on the five coin machines requires a higher bankroll, as you must have more coins available for a round of play. I prefer the three coin multipliers, not only because the bankroll is less for these machines, but because I have experienced superior results on the three coin machines.

If you plan on playing just two or three hours a day, then your daily bankroll will be large enough to accommodate the loss of four complete ladders on a slot machine. If you plan on playing longer than three hours per day, I recommend that you bring enough per day to survive the loss of six ladders.

The amount needed for a ladder is simply the total of all wagers in a particular ladder. A ladder for a Standard 3 Coin Multiplier, with a 10x target win is 28 coins as shown below:

Ladder for 3 Coin Standard Multiplier, 10x Win

Wagers	**Total per Level**
9 bets of 1 coin	9 coins
5 bets of 2 coins	10 coins
3 bets of 3 coins	9 coins
Total Coins	28 coins

The light gambler, needing a daily bankroll of four times the 3 Coin Multiplier Ladder, will need to take a daily bankroll of 112 coins (4 x 28 = 112). The player planning on three or more hours of play per day will need a larger daily bankroll of 168 coins (6 x 28 = 168).

If you want to play on the Standard 5 Coin Multipliers then you will need 50 coins per ladder as follows:

Ladder for 5 Coin Standard Multiplier, 10x Win

Wagers	**Total per Level**
9 bets of 1 coin	9 coins
5 bets of 2 coins	10 coins
3 bets of 3 coins	9 coins
3 bets of 4 coins	12 coins
2 bets of 5 coins	10 coins
Total Coins	50 coins

For light play, the daily bankroll will be four times 50 or 200 coins. The moderate bankroll will be six times 50 for 300 coins.

The following table shows the daily bankroll needed for playing $.05, $0.25, $1.00 and $5.00 machines for both light and moderate play.

Table 36. Daily Bankroll for 4x and 6x Loss Limits

	$0.05	**$0.25**	**$1.00**	**$5.00**
4x Loss Limit				
3 Coins	$5.60	$28.00	$112.00	$560.00
5 Coins	10.00	50.00	200.00	1000.00
6x Loss Limit				
3 Coins	8.40	42.00	168.00	840.00
5 Coins	15.00	75.00	300.00	1500.00

Using this chart is easy. If you like to play quarter slots, for more than three hours a day, and you will be playing the 3 Coin Multipliers, then you will follow the row under 6x Loss Limit for 3 Coins to the Column labeled $0.25 and the amount of your daily bankroll is shown as $42.00. If you only plan on playing a couple of hours a day on a 3 coin dollar slot, then you will need the bankroll shown under 4x Loss Limit and $1.00 of $112.00.

Before using this chart you should be honest about your playing style. If you plan on investing even a moderate amount of time playing slots, you should pick the higher bankroll amounts shown under 6x Loss Limit.

The purpose of these daily bankrolls is to give you multiple shots at beating the slot machines, with defined loss limits on how

much you will be willing to lose in a day. The term "loss limit" is just that, the maximum amount you will lose in a day's play before you stop playing. It is your safeguard against ever losing more than you can afford. These limits must always be adhered to if you wish to overcome occasional losses and live to fight another day. On a brighter note, we also have guidelines for your daily target winnings, which we will discuss shortly.

In planning a casino excursion, you will need to know how much your total bankroll should be to match your playing style, the length of your trip, and the denomination of slots on which you will play. Table 37 can be used to help you plan your bankroll.

Table 37. Trip Bankrolls for 4x and 6x Loss Limits

	$0.25		**$1.00**		**$5.00**	
	2 Days	**3 Days+**	**2 Days**	**3 Days+**	**2 Days**	**3 Days+**
4x Loss Limit						
3 Coin	$56	$84	$224	$336	$1,120	$1,680
5 Coin	100	150	400	600	2,000	3,000
6x Loss Limit						
3 Coin	84	126	336	504	1,680	2,520
5 Coin	150	225	600	900	3,000	4,500

If you have a bankroll put together, say in the amount of $1,000, then you can use the table to determine the type of machine you will play and the number of days you are qualified to play. With $1,000 bankroll, for instance, you could play both 3 Coin and 5 Coin $1.00 slots, for three days or longer. You could

also reduce the amount of your slots bankroll and play quarter slots. Or you might decide to allocate a portion of your bankroll to slots play and use the rest of your bankroll for table games.

If you know the length of a planned casino stay, and are determined to play 3 Coin $1.00 slots, then the table tells you that if you are a moderate player (three or more hours a day of slots play), you will need a minimum slots bankroll of $504.

I left off any information in the table about the nickel slots. You are not likely to find any nickel slots which are worth playing (at least not with any serious expectation of winning) so I did not bother to include any bankroll information about these machines.

In addition to matching your bankroll to your playing style, you will need to keep track of your bankroll as you play. This is not difficult. Say that you decide to begin play on a 3 Coin Multiplier, using a 10x ladder. Since this ladder requires 28 coins, you will begin play with 28 coins in a slots bucket. As you play the machine, you will let any winnings fall into the slot tray below and continue to play using only coins from your bucket. One of two events will occur which will cause you to pause and count the coins in the tray. If you hit a 10x or greater payoff, you will have completed the ladder and you will count the coins in the tray to determine your winnings. If you complete a ladder without a 10x or greater win, you will count the coins in your tray to see how well you did for the round.

You will also need to keep a running count of the number of pulls so that you know exactly where you are on the ladder. I will use a small card, which fits in my pocket, and keep a count of

each level of the ladder. When I have finished a level, I will place a small mark next to that level on the card. As the round continues, I will keep a mental count for each level of the ladder and place a mark on the card when that level is finished. When a round is completed, either by having made all the bets in the ladder or through hitting a 10x or greater win, I will count coins and the number of wagers made and record them on my card. Table 38 illustrates how such a card may be set up.

Using a card like this makes it very easy to accumulate the information needed to not only keep track of your bankroll, but to develop the information needed to cycle analyze the machine.

Let's see how the card has been used in this example. We began playing this slot using a 3 Coin Ladder, and our first 10x payoff occurred in round 1 after 16 pulls. As we were playing the round, we placed a mark as we completed each level in the ladder. As is shown in column one in Table 38, we placed our first mark next to "9 — 1 coin" after we had inserted our first nine coins and completed the first level of the ladder.

Table 38. Tracking Card for 3 Coin Multiplier

Number of Ladder	1	2	3	4	5	6	7	8	9	10
Betting Level										
9 — 1 coin	/	/	/	/						
5 — 2 coins	/	3	/	1						
3 — 3 coins	2		/							
Round:										
Bets	16	12	17	10						
Won (Lost)	+8	+12	-4	+28						
Bets to Hit	16	12	-	27						

In this round, we also completed the second level, and placed a mark next to "5 — 2 coins" as we completed this level. Two bets into the third level of the ladder we hit a 10x payoff, so we wrote a "2" next to "3 — 3 coins" to record the number of pulls needed at this level. At the bottom of column 1 we recorded the information for this round. We had made a total of 16 pulls (9 at level one and 5 at level two, plus the 2 needed in level 3) so we recorded this information in the row called "Bets." We next counted the coins in the slot machine tray. There were 33 coins in the tray and 3 coins in the bucket for a total of 36 coins. Since a ladder for 3 Coin play totals 28 coins, it was easy to compute our round win of 8 coins. We also recorded the number of hits required to hit a qualifying payoff, in this case 16, recorded on the row labeled "Bets to Hit." This may seem superfluous in this

round, but not all rounds end so neatly with a 10x or greater hit before the ladder is completed, so that recording this information is important as it is number of hits we use for analyzing a machine's cycles.

In the next round of play (round 2 in the table), a total of 12 pulls were required to reach a payoff hit. We recorded this information in the same manner as round 1, noting that 12 "Bets to Hit" were required. Round 3 did not go as smoothly and we completed the ladder without hitting a payoff. In this case, we were blessed with a number of lessor payoffs so that we did not fare too badly, losing only 4 coins for the round. Please note that we left Bets to Hit blank for this round, as we had no 10x or greater payoffs. Round 4 required 10 bets before we hit a payoff. Here we recorded the 10 bets required for the round in the row "Bets" and recorded the total number of bets required to hit a payoff in Bets to Hit. We needed a total of 27 bets to hit this payoff, 17 from round 3 and 10 from round 4. As you can see, we added the bets from two rounds to compute the number of bets needed to hit a 10x or larger payoff.

With the information in this table, we could begin to cycle analyze this machine. Things seem to be going well at this point. We have completed four rounds of play and have accumulated winnings of 44 coins. We might make a preliminary determination that this is a machine which we will want to continue playing and we would want to increase our winnings rate even more by using the Cycle Approach. Here's where we must be a little more patient. We simply don't have enough information at this point to compute a cycle. I generally play long enough to have had at least six 10x or greater hits before I analyze the

machine. On the "good" machine, this can take anywhere from seven or eight to as many as ten rounds of play. You will notice that the sample card shown as Table 38 has 10 columns (rounds) set up. This is not by accident, as ten rounds is a good number of rounds to play to develop the information you need to cycle analyze a machine.

In addition to information which can be used for cycling, this card contains all of the information needed to record the results of your play on this particular machine. By recording your playing results as you go, you will be able to record exactly how much you have won (or lost, losses do happen you know) when you have finished a session on this machine.

After I have completed a session on a slot machine, I will record the name of the casino, the date and the machine location and the machine number on the other side of the card. This is part of my personal record keeping which accomplishes several things. It gives me a complete permanent record on my play on this machine, records the information I will need to substantiate slot wins or losses and helps me locate a particularly good machine (or avoid a bad one) on my next casino excursion. My information on the reverse of the card might look like this:

4Qs — Las Vegas
May 5, 1994
Machine: Right bank next to slot cashier, 3 down
Machine Number: IGT-43062

After finishing play at a slot machine, I will total up my wins and losses and record this information on my Slots Record. In addition to the amount won or lost, I will record the date, the casino, the machine number, the ladder used, the machine location and any comments I think are important. Table 39 illustrates a partial trip record, for one day of slots play.

Table 39. Slot Record — One Day of Play

Date	Casino	Machine Number	Ladder	Location	Won (Lost)	Cum Won (Lost)	Com-ment
4/5/94	4Qs	1829	$28	4 Corner 2 Bank 2 Slot	+145	+145	
4/5/94	4Qs	1829	$28	same	+335	+480	
4/5/94	GN	4136	$28	3 Corner 1 Bank 1 Slot	+102	+582	

I use my own shorthand for recording the machine's location, so that I can locate the machine the next time I visit the casino. Although it is not included in this record, you might want to note the amount of time you spent playing. Then as you become even more proficient at winning, you can compute the amount of winnings per hour of play!

The Slots Record is the basis for figuring the net amount won or lost on any casino excursion. I also keep a record of trip expenses, and when I get home, I will deduct all trip expenses from my casino winnings so that I know exactly how well I did on a particular trip. There is great satisfaction in having three or four days of fun and returning with significantly more money than I started with.

Another key ingredient to winning is controlling the losses and aiming for target wins. We saw how we used loss limits in determining the amount of bankroll we would need to play the slots. When you are playing, it is important that you stick to the daily loss limits. If your daily limit is 6x a Ladder, and you lose this amount of money, then your slot's play for that day is finished. You will not invest any more money in slots that day.

To control losses on individual machines is somewhat of an art. Assuming that you have picked your machine carefully, using our guidelines, you should not get hurt too badly using The Ladder Approach, even on a turkey machine. However, if I lose two ladders when I first begin playing a machine, I am inclined to leave that machine. While a loss of two consecutive ladders is not uncommon on a decent machine, I am unwilling to take the chance if I have a two ladder loss when I first begin playing.

So the daily loss limit is further adjusted to a two ladder loss per machine. Assuming we manage to pick three losers in a row, we will have a shot at three machines before we reach the 6x daily loss limit and call it quits.

I also use targeting wins to help smooth out my wins and losses. By targeting a win, I mean setting up a predetermined daily profit goal, and when that goal has been reached, calling it quits for the day. A reasonable daily goal, using the Super Slots system is to double your daily bankroll. When this goal is reached, your slots play is over for that day.

A frustrating aspect of Super Slots is that sometimes the target win is reached all too quickly. If you have planned on four or five hours of slots play and you hit your daily win target in an hour and a half, you may feel like you have been cheated on your planned playing time. I have an easy solution for you.

The best approach is to learn another casino game, such as video poker, if you want to stick with the machine brand of gaming, or a table game, such as craps, roulette, baccarat or blackjack. After hitting your targeted daily slots win, play the other game for awhile. If you use the style of play that I advocate, you will have daily loss limits and target wins for each casino game you play. On more than one occasion I have hit my targeted slots win in an hour or so, proceeded to the craps table and hit my targeted craps win in another hour, taken a break, played blackjack and exceeded my target for blackjack in another hour or two. While this approach to gambling may leave you some time on your hands, the sweet feel of victory more than compensates for any idle time you have earned in your battle against the casinos.

If you are determined to continue playing slots after doubling your daily loss limit, then you should put aside all of your winnings and one-half of your daily bankroll, so that you will be playing with only enough money to complete three ladders. If you lose this money, you will quit, with a three ladder win tucked safely away. If you double this money, then add three more ladders to your "safe" money and keep on playing as long as you like.

Either approach can be satisfactory. I prefer changing games, because I happen to enjoy craps, blackjack, some roulette and an occasional hour or two of video poker. I recommend that you try this approach as it will make your casino visit more interesting, and hopefully even more profitable if you learn how to beat these games. Silverthorne Publications has excellent publications on how to beat each of these games, and I recommend them to you highly.

If you decide to continue with slots after hitting your daily target win, you won't get hurt if you use my suggestion and lock up all of your daily bankroll plus half of your winnings.

You probably will find that the most difficult aspect of mastering the Super System is adjusting to becoming a regular winner. You won't have the good stories about how a particular slot machine wiped you out. Your friends may begin to look askance at you, as you seem to win too much. Many persons begin to feel guilty when they win, as it just doesn't seem right that they should be gambling and winning. If you look at your slot playing as your own little business, with limited amounts to be invested and certain records to be maintained, you will begin to

put the experience of winning into perspective. Once you experience the tremendous satisfaction of planning and controlling a gambling trip, and returning home with more money than you left with, you will probably become as addicted to winning as most folks seem to be to losing.

SLOTS AND THE IRS

You may not like playing with a partner, but whenever you hit a jackpot of $1,200 or more, the United States Internal Revenue Service is ready to step in and become your partner. On larger wins you are expected to share the largess and to include the winnings in your taxable income.

The official position of the IRS is that any gambling winnings must be reported as income, but since most wins are in the form of cash, most gamblers operate under the principle of "who's to know," and skip on giving the government its anointed pound of flesh. However, on wins of $1,200 or larger, the government has pressed the casinos into a form of uncompensated government service, and they are required to report your winnings to the IRS.

If you hit a larger jackpot on a slot machine, the kind that requires an attendant for the payout, you will be asked for a form of identification which shows your social security number. When this occurs, it does absolutely no good to complain to the casino, as its personnel are probably just as annoyed as you are with the government intrusion into your and its private business. After furnishing the casino with suitable identification, you will be

given a W-2G form — "Statement from Certain Gambling Winnings." Copy A will be sent to the IRS by the casino, and Copy B will be given to you to file with your income tax return.

If you don't have any identification with you, or if you decide that who you are is your business and not the government's, then instead of receiving a casino check for the jackpot, you will receive a casino receipt pending your furnishing the casino with information required by the IRS.

If you are a United States resident, no taxes are normally withheld from your winnings. If you reside in Canada, 15% of your winnings will be withheld. If you reside in any other foreign country, the IRS will withhold 30% of your winnings on the spot.

A bright spot in the government's insatiable thirst for revenue, is that when you file your tax return, you are allowed to deduct gambling losses to the extent of gambling winnings. This is sort of a "heads I win, tails you lose" proposition. If you have net gambling losses, so sorry Charlie, you can't deduct them; if you have net gambling winnings, please pay up. Gambling winnings are reported as gross income, just like salary and interest income. Gambling losses may be taken as an itemized deduction. If you normally itemize deductions (you probably do if you own a home with a mortgage), then you may deduct the gambling losses (but only up to the amount of your winnings). If you don't itemize deductions, then the losses will probably not do you much good in terms of reducing your taxable income.

In order to deduct gambling losses, you must be able to substantiate them. Here's where your slot record keeping comes in

handy. You will have recorded every loss on slot machines you have played. The IRS will accept this record so long as you supply other substantiating proof that you really were in the casino playing slots on the date that you claim. To further document this, you should write down the names of persons who were with you when you were gambling, and you might want to jot down the names of any attendants helping you with change. In addition, if you win a jackpot, you will be assisted by casino management, and you should ask for their business cards so that you can record their names. Other documents you should keep are restaurant receipts, keno tickets, airline tickets, and the invoice for your hotel room. These items will serve as evidence proving that you really were where you claimed to be.

If you belong to a slot club, the casino has an account of your slot play in their casino. Whenever you have an IRS reported win, you can request that the casino verify your total play by furnishing a spread sheet of your play. As an alternative, you can request that a "Statement of Loss" form be furnished by the casino.

An easy way to meet all the IRS guidelines for documentation is to keep the daily record of slots play, as well as invoices, receipts and other information from your trip. File all this information in an envelope. Then when you hit a jackpot, and the IRS invites itself to share in the banquet, you will be prepared to minimize the tax impact on your winnings.

WINNING WITH THE SUPER SYSTEM

We have introduced two types of approaches for playing slots: simple pattern betting using Dead Pulls to limit losses on any machine and the more involved Super System. Some slot jurisdictions have very few of the machines suitable for the Super System, and on these machines (candidates are any multiplier, including progressives) I use the location selection rules to find the best machine. I will then use either the Cycle or Frequency pattern of betting. While the pattern method is not complicated, it is sound and is recommended whenever you can't find a machine suitable for the Super System.

The steps for winning using the Super System are very straight forward and are easy to use. We will summarize the steps here, for your convenience. If you don't completely understand any of the steps, you should refer to the chapter covering the step to refresh your memory.

1. You will limit your play to only certain types of **Multiplier** slot machines. You will play a 3 or 5 Coin Multiplier which does not penalize you for playing less than the maximum number of coins. These machines can be identified by reading the pay schedules on the front of the machines. In playing only these **Standard**

Multipliers, you will refrain from playing any of the machines which do penalize you for playing less than the maximum number of coins on each pull. These machines include the **Option Multipliers**, also called the **Buy-a-Pay** machines, which do not pay off on all of the payoff symbols unless the maximum number of coins are inserted, and the **Multiple Pay Line** slots which bring additional pay lines into play as more coins are inserted. By limiting your play to Standard Multipliers, you will able to play from one to five coins (depending on the machine) without any penalty in the programmed payoffs.

2. Among the Standard Multipliers, you will seek to play only **High Frequency** payout machines. By High Frequency, we mean machines that pay off on the 2, 5 and 10 coin payouts frequently. It is not always easy to identify these machines, however they usually feature a larger number of the smaller payoffs. Avoid playing **Progressive slots**, **Linked-Progressive slots** and **Jackpot Only** machines. Needless to say, any of the specialty machines, such as the Berthas or the novelty machines, like the horse racing machines, will not warrant any play.

3. Play slots at the best locations. In general, Nevada offers the highest paying slots and Atlantic City offers the lowest paying ones. In the state of Nevada, downtown Las Vegas and Reno offer the best odds for winning, although with an average payout of about 95%, any of the casino slots in Nevada offer a fair chance of winning. Always confine your play to slots in casinos. Slots in grocery stores, service stations, bars and other roadside locations should be avoided.

4. Avoid playing nickel slots. Our studies confirmed that it is almost impossible to find a loose nickel slot. The penalty for being allowed to play with a small bankroll is pretty stiff, and you won't have much luck winning on these machines. In Nevada, quarter, dollar and five dollar machines all offer acceptable paybacks. We prefer the dollar machines, as machines paying 97% or higher can readily be found, making these machines superior candidates for the Super System.

5. The location of the slot machine in the casino is very important. Our studies revealed that the more visible a machine is to other slot players, the more likely the machine is to be loose. We also found that loose machines are very seldom, if ever, placed next to each other. The practice of some slot players of playing two adjacent machines is not a good one, as one of the machines is likely to be tight. Our rules for finding a good machine and avoiding tight ones are:

a. Avoid playing machines directly next to table games. Also avoid machines next to where show and ticket lines form. Avoid machines on aisles that table game players use going to and from the elevators. Avoid slots near the sports book.

b. Do play machines near casino coffee shops, near the slot change booths and on elevated slots carousels. In general, the more visible a machine is to other slot players, the more likely it is to be a good payer.

c. Play slots on small slot islands, clearly visible from two or more slot banks.

6. On any slot machine selected to play, first use **The Ladder Approach** to evaluate the machine and to protect your bankroll while you are in the process of evaluating a machine. We prefer the **3 Coin Multipliers** over the **5 Coin Multipliers** because the number of coins needed to complete a ladder is less. We usually target a win **10 times the amount of coins inserted.** Typical ladders for 3 Coin and 5 Coin Multipliers, with a targeted 10x win are:

Ladder for 3 Coin Standard Multiplier, 10x Win

Wagers	**Total per Level**
9 bets of 1 coin	9 coins
5 bets of 2 coins	10 coins
3 bets of 3 coins	9 coins
Total Coins	28 coins

Ladder for 5 Coin Standard Multiplier, 10x Win

Wagers	Total per Level
9 bets of 1 coin	9 coins
5 bets of 2 coins	10 coins
3 bets of 3 coins	9 coins
3 bets of 4 coins	12 coins
2 bets of 5 coins	10 coins
Total Coins	50 coins

Use of these ladders is optional. We have also had good results with 15x and 20x multipliers. However, machines matching the 10x formula are more common. You may want to experiment with different ladders if you find a machine paying off well on 15x or 20x payoffs.

7. After finding the slot you want to play and determining the appropriate ladder, you will begin playing the machine. You will use **Tracking Cards** like the ones shown on the next page to track your winnings. You may wish to photocopy these cards for your use in a casino. Use of the Tracking Card is explained in detail on pages 73-74. Before beginning a **round** on a ladder, you will place the amount of coins needed to complete a ladder in a **slots bucket** provided by the casino. Only play coins from the bucket in each round. At the end of a round, which is signaled either by hitting a 10x or greater payoff (or any other targeted win you have selected) or by completing all of the wagers in the ladder, you will count the number of coins in the **slot tray**, add the number of

coins, if any, remaining in the slot bucket and determine the amount you won or lost for the round. This information will be recorded on the Tracking Card as well as the number of pulls needed to hit a target win.

Tracking Card Used for 3 Coin Multiplier

Number of Ladder	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Betting Level										
9—1 coin										
5—2 coins										
3—3 coins										
Round:										
Bets										
Won(Lost)										
Bets to Hit										

Tracking Card Used for 5 Coin Multiplier

Number of Ladder	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Betting Level										
9—1 coin										
5—2 coins										
3—3 coins										
3—4 coins										
2—5 coins										
Round:										
Bets										
Won(Lost)										
Bets to Hit										

8. Play on the machine long enough to accumulate 6 or more hits of 10x or greater. Generally, ten rounds of play will be enough to accomplish this if the machine offers reasonable prospects for winning. If you lose the first two ladders on a machine, quit and find another machine.

9. After six or more qualifying hits have been made, you will analyze the number of pulls needed for each hit. You will compute **s, the Standard Deviation,** and x**, the Mean**, for the **Sample** of hits you have recorded. After determining these

values, you will exclude any hits which required a greater number of pulls than **(x + s).** After excluding any values which are too large, you will recompute **s** and x for the **modified data**. The easiest way to make these calculation is to use a inexpensive statistical calculator, which may be found in any store where hand held calculators are sold.

10. Using the calculations for x and **s**, you will set up the **Betting Cycle** to be used on this machine. The approach for either a 3 or 5 Coin cycle is:

3 Coin Wager	**5 Coin Wager**	**Cycle Formula**
1 Coin	1 Coin	When number of pulls are between 1 and $\bar{x}$ **- s**
3 Coins	5 Coins	When number of pulls are between **(**$\bar{x}$ **- s + 1)** and $\bar{x}$ **+ s**
2 Coins	3 Coins	When number of pulls are between **(**$\bar{x}$ **+ s + 1)** and **2** $\bar{x}$

11. Continue playing with the selected machine using the **Cycle Betting Approach.** As you play, be sure to record the results of each round of play, using the **Tracking Card**. Sometimes after I have played for awhile, using Cycle Betting, I will recompute the Betting Cycle, using the additional data I have accumulated while Cycle Betting. This approach can refine the Betting Cycle even more. As you play, keep your target win as well as your loss limit in mind. Even good machines run through dry periods, resulting in losses. Use the predetermined loss limit to control any losses. The typical slot player may be ahead at some point in his play and

end up losing his winnings as well as his original bankroll. You do not want to do this, especially after you have had a good win. Use the **Target Win** guidelines to "lock up" your slots profits.

12. Learn another casino game, or other diversions you enjoy so that you will not resist taking a break when it is time. Times to take breaks are when you are tired, when you have become frustrated with playing, when you have lost your daily limit, after hitting the daily target win, or when other scheduled activities (such as dinner) are planned. There is no reason to become a "Slot Addict" when using the Super System. The slots are always there and the system can be used whenever you wish. The value of learning another game is that you will reduce the risk of "slots burnout." Even though you should become a regular winner using the methods in this book, there is no reason that you should play slots beyond the point where it is enjoyable. I find that my personal limit for slots play is about two hours at a time. If I still feel the tug of casino ambience after taking a break from slots, I will play craps, blackjack, roulette or video poker. I highly recommend learning a casino table game, such as craps, for slots breaks. Craps offers the chance to interact with other people, to handle the dice, if you are so inclined, and is a great source of relief from slots fatigue.

Writing this book has been a monumental effort. Developing the Super Slots system required untold hours in casinos, testing each new theory, eliminating the ones that seemed "good on paper" but failed to hold up under real casino conditions, and finally refining the system which has been presented in this

publication. I owe a wealth of gratitude to my colleagues who assisted me in testing many, many slot machines so that we could determine where the best ones were located and refine our betting methods.

The product of this research and effort has been presented here. I hope that you will find our slot selection methods and betting approach are worth their weight in gold. I, as well as friends, associates and acquaintances who have used the Super System, have experienced excellent results using this approach. It is my fervent hope that you become a consistent slots winner and will drop me a line sharing your successes.

I think that this book has given you all the tools you need to become a **Super Slots Winner!** So what are you waiting for? Go out there and Start Beating the One-Armed Bandits!

And good luck!