

**PROFESSIONAL
VIDEO
POKER**

STANFORD WONG

Pi Yee Press

PROFESSIONAL VIDEO POKER

by
Stanford Wong
Pi Yee Press

copyright © 1988, 1991, 1993, 2007 by Pi Yee Press

All rights reserved. No part of this book may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the publisher. Inquiries should be addressed to Pi Yee Press, 4855 W. Nevso Dr, Las Vegas, NV 89103-3787. Telephone (702) 579-7711.

ISBN 0-935926-15-1

Always printed in the United States of America

6 7 8 9 10

cover photo courtesy of Gamblers General Store, Las Vegas

PREFACE

Some of my Nevada friends support themselves primarily by playing video poker. They live in Las Vegas, but occasionally travel to Reno and Stateline and find profitable opportunities there.

I worked with them to devise the strategies they are using. Presenting those strategies is the purpose of this publication. The material in this publication has had more than a year of testing in the casinos of Nevada.

Some of this material has previously been published. Volume 6 of *Stanford Wong's Blackjack Newsletters*, published in 1984, presents strategies for playing video poker. Those strategies were devised with accuracy in mind. Speed also is important. You can make more money per hour with an approximate strategy if it allows you to play enough more hands per hour.

The video-poker strategies used by the pros have what I think is the optimal balance between accuracy and speed. These strategies were devised with the

intent of maximizing winnings per hour. These strategies differ from perfect play by 0.06%. That is, the strategies in this book capture 99.94% of the payback that a computer would achieve making the best play every time.

If you have seen my 1984 strategies, you may have marveled at how complicated they look. Complicated-looking strategies are not what you want to refer to when you are playing video poker in a casino.

The strategies used by the pros do not look complicated. The reason is we worked together to devise the simplest possible format for presenting the strategies. Each strategy is presented in a compact chart that uses easy abbreviations for the different possible draws. You do not have to memorize the strategy because you can find the correct play for any hand in just seconds. After you have played video poker for a while, you will have memorized the correct strategy for most of the hands you play, and you will have to look at the chart only for advice on how to play an unusual hand.

Proper playing strategy alone is not enough. Not every video poker machine is beatable. In fact, most video poker machines have an edge over you. To make money at video poker, you must be able to identify those machines over which you have an edge. This book tells you how to do it.

And if you are really serious about making money, you not only want to know whether you have an edge, you want to know how much you are expected to make per hour. This book tells you how to find your expected win per hour.

I carry my video-poker strategy in my wallet. I play if I find an opportunity that is attractive enough.

In the best video-poker opportunity I personally have played, in early 1987, I estimate my time was worth \$150 an hour; the pros play quicker than me, and their time probably was worth \$200 an hour on that bank of machines.

You probably will not find any \$200-an-hour video-poker opportunities. But you could support yourself at video poker. Video-poker pros still exist as this book is being restyled in 1991; I think they will continue to exist for a long time. Sometimes they find more profitable machines than they personally can play, so they hire other people by the hour to play the machines for them.

Thank You

Thanks to the video-poker pros who inspired and helped create this material — Anne Amster and Dave Douglas.

Also thanks to John B. Speer, whose detailed comments on the first printing of the first edition helped make this book more understandable.

Extra Tables Included

The page inside the back cover has the two most important tables in this book reduced to wallet size. Feel free to cut them out or reproduce them and carry them with you when you visit casino country.

1991 Restyling

In the 1991 restyling, all the tables were moved to the left pages; the right pages still contain the text. I think this makes the material easier to use.

Since first publishing *Professional Video Poker* I have done extensive computer work on the subject, which

resulted in some changes to this book. The biggest change is the addition of tables of frequencies of final hands for seventeen different payoff schedules. Precise payback percentages for the various payoff schedules also have been added. The break-even point for the 6-5 machines more common in Atlantic City was changed from \$3000 to \$3100. Most of the rest of the material remains unchanged, which is why I call this a restyling instead of a new edition.

1993 Printing

The index was added. Other changes were minor.

1994 Printing

The cover was improved.

2007

The material was compressed slightly, and blank pages were removed.

CONTENTS

Chapter 1: Win Rates	12
Evaluating Payoff Schedules	14
Rate of Play	21
Marginal Win Rate	21
Risk While Waiting For	
a Royal Flush	27
Overall Risk	29
Average Winnings Per Hour	31
Details of Strategies	36
Chapter 2: 8-5 Progressive Strategy	37
Break-Even Points and Win Rates	39
Strategy for 8-5 Progressive	40
Boldface Numbers	41
Numbers in the Column on the Left	43
Table 13 Line By Line	44
2853 5 SF	44
Omitted Hands	45
4 RF	45
6003 5 flush	45
4964 3 trips	46
4557 5 straight	46
3942 4 ss Q-J-10-9	47

3 RF 47
 4 two pair 47
 4 SF 47
 2 high pair 47
 4 flush 48
 4 K-Q-J-10 48
 5640 2 low pair 48
 5577 4 Q-J-10-9 49
 4484 4 J-10-9-8 49
 3246 3 ss Q-J-9 49
 2 ss HC-HC 49
 5573 4 consec no HC 50
 5531 3 ss J-10-9 50
 3656 3 SF 1 gap 1 HC 50
 3280 3 SF consec no deuce 51
 2 ss HC-10 51
 4 ace-high straight 51
 3 K-Q-J 51
 2 HC-HC 52
 1 HC 52
 3 SF 52
 0 nothing 52
 Coming Next 53

Ch 3: Fine Points of 8-5 Strategy 54

2853 5 SF 56
 6003 5 flush 56
 4964 3 trips 58
 4557 5 straight 59
 3942 4 ss Q-J-10-9 60
 4 two pair 62
 4 SF 64
 2 high pair 65
 4 flush 66
 4 K-Q-J-10 68
 5640 2 low pair 68
 5577 4 Q-J-10-9 74

4484 4 J-10-9-8	76
3246 3 ss Q-J-9	78
5573 4 consec no HC	80
5531 3 ss J-10-9	81
3656 3 SF 1 gap 1 HC	83
3280 3 SF consec no deuce	85
4 ace-high straight	87
3 K-Q-J	88
2 HC-HC	89
1 HC	90
3 SF	91
Cost of Errors	92
Ch 4: Other VP Strategies	94
Strategy for 6-5 Progressives	94
Strategy for 10s-or-Better Progressive	99
Video-Poker Tournaments	102
Two Jackpots	102
Cards In Order	103
Cards In a Particular Suit	103
Double Option	104
Second-Chance Feature	105
Wild Cards	106
Attitude of Casino Personnel	110
Literature Cited	116
Index	117
About the Author	119
Books by Pi Yee Press	120
Wallet-Size Strategies	123

LIST OF TABLES

1	9-6-1000: Payoffs & Frequencies	13
2	8-5-3200: Payoffs & Frequencies	16
3	9-6-800: Payoffs & Frequencies	18
4	9-6-250: Payoffs & Frequencies	20
5	8-5-1000: Payoffs & Frequencies	22
6	8-5-800: Payoffs & Frequencies	24
7	8-5-250: Payoffs & Frequencies	26
8	6-5-1000: Payoffs & Frequencies	28
9	6-5-800: Payoffs & Frequencies	30
10	6-5-250: Payoffs & Frequencies	32
11	10s, 9-6-1000: Payoffs & Frequencies	34
12	Payoffs on 8-5 Progressives	38
13	Strategy For 8-5 Progressives	42
14	Breaking a Pat Flush	55
15	Breaking Trips	57
16	Breaking a Pat Straight	59
17	Discarding the 9 From ss Q-J-10-9	60
18	Two Pair or Three of a Royal	61
19	Four of a Straight Flush or Three of a Royal	63

20	K-Q-J-10 or Two of a Royal	67
21	Low Pair or ss HC-HC	69
22	Q-J-10-9 or ss HC-HC	72
23	Q-J-10-9 or ss HC-10	73
24	J-10-9-8 or ss HC-J	75
25	J-10-9-8 or ss J-10	75
26	ss Q-J-9 or ss Q-J.....	77
27	10-9-8-7 or ss HC-10	79
28	ss J-10-9 or ss J-10	81
29	Three of a Straight Flush or ss HC-10	82
30	Three Consecutive ss or ss HC-10	84
31	Four of Ace-High Straight or ss HC-10	86
32	6-5-2400: Payoffs & Frequencies	93
33	Strategy For 6-5 Progressives	95
34	10s, 9-6-4000: Payoffs & Frequencies	98
35	10s-or-Better Progressives	100
36	Joker, Kings: Payoffs & Frequencies	107
37	Joker, 2 Pair: Payoffs & Frequencies	109
38	Deuces Wild: Payoffs & Frequencies	111
39	Deuces & Joker: Payoffs & Frequencies	113

CHAPTER 1

WIN RATES

Video-poker slot machines have been proliferating. The most common are draw poker using one 52-card deck with a shuffle after every hand. First you insert your bet; then you are dealt five random cards. You decide which, if any, of the five you want to keep. For the cards you discard, you are dealt random replacements from the remaining 47 cards. Then your hand is evaluated, with the different possible poker hands winning specified numbers of coins.

Since you decide which cards to keep out of your first five, there is skill involved. The proper way to play some video-poker hands is different from the way you would play those same hands in a regular poker

Table 1

9-6-1000: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	1000	0.0028
Straight Flush	50	0.0111
Four of a Kind	25	0.2355
Full House	9	1.1484
Flush	6	1.1129
Straight	4	1.1306
Three of a Kind	3	7.4148
Two Pair	2	12.8898
Pair, Jacks or better	1	21.2649
No Pay	0	54.7892

Payback: 100.07

game. In video poker you are simply trying to get certain card combinations; you are not trying to beat anyone else's hand.

There is such a thing as proper playing strategy for video poker. You are dealt five cards, and whether you hold or discard each one is up to you. For a given set of payoffs, one play is best in the sense of making more money on average than the other possible ways to play the hand.

Different payoffs for the various final hands mean differences in proper playing strategy. This book presents playing strategies that change with the size of the jackpot rather than being fixed. The changes involve making more draws to try for a royal flush as the payoff for a royal flush increases.

Evaluating Payoff Schedules

Different playing strategies yield different frequencies of final hands. Precise frequencies of final hands can be calculated if a particular playing strategy is specified. Table 1 contains a payoff schedule that has a slight edge for the player who plays perfectly. The payoff is expressed as a ratio of coins returned to coins bet. For example, the royal flush at 1000 can mean 5000 coins returned on a bet of five coins.

Table 1 also contains frequencies of the various final video poker hands, assuming perfect play. The frequencies are in percent; for example the frequency of a royal is 0.0028%, which is the same thing as 0.000028. These frequencies were calculated by VPEXACT, a computer program I wrote for IBM PCs.

One thing of interest in table 1 is the similarity of the frequencies of full house, flush, and straight. Each is approximately 1.1%.

A customer who uses perfect playing strategy has a payback of 100.07%, which means an edge of 0.07% over the casino for the payoff schedule of table 1. The break-even royal-flush jackpot for perfect play on 9-6 machines is 976 coins. Some Nevada casinos have "flat-tops," i.e. non-progressive machines, that have the payoff schedule shown in table 1. The casinos make money on those machines only because of customer mistakes.

You ought to play some hands differently as the jackpot increases. Each strategy change is accompanied by a slight increase in the probability of hitting a royal flush, and also a slight increase in the per-hour loss rate while waiting for a royal flush.

On average, a royal flush occurs once per 30,000 to 50,000 hands, depending on how aggressively you try for a royal. This assumes each card remaining in the deck is equally likely to be drawn, and each combination of cards is equally likely. (If you try for royals only, you should get one per 21,745 hands.)

The technology exists to make some cards more likely to be drawn than other cards, or to make some combinations of cards more likely than other combinations. For example, when you draw one card to four of a royal flush, the machine could be set to give you the card you need with less than the proper frequency of $1/47$. In my opinion this would be cheating. So far as I know this has not yet occurred in the legal casinos of

Table 2

8-5-3200: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	3200	0.00317
Straight Flush	50	0.00947
Four of a Kind	25	0.2355
Full House	8	1.1455
Flush	5	1.1127
Straight	4	1.0927
Three of a Kind	3	7.4232
Two Pair	2	12.8750
Pair, cks or better	1	20.9741
No Pay	0	55.1288

Payback: 104.60%

Nevada or Atlantic City. However, some professional video poker players are less confident about some overseas video poker games. If you are playing video poker against machines that promise a generous pay-off percentage but seem to take everyone's money too quickly, save your quarters for a trip to Las Vegas.

You can use table 1 to estimate the casino edge on machines with payoff schedules that differ from it in only minor ways. The most common differences are in the payoffs for royal flush, full house, and flush. Each 1-coin change in the per-coin payoff for full house or flush means about 1.1%. Each 1000-coin change in the per-coin royal-flush payoff means about 3%; thus on those stretches in which you play these machines without hitting a royal flush, you lose about 3% faster than average.

Chapter 2 covers machines that pay 8 for a full house and 5 for a flush. That is one bet less for a full house and one bet less for a flush than the payoff schedule of table 1. Since full house and flush each occur about 1.1% of the time, 8-5 machines have a 2.2% greater house edge than otherwise-identical 9-6 machines.

The hand frequencies in table 2 apply to the playing strategy appropriate for a royal-flush payoff of 3200 coins per coin bet. (On a quarter machine with five coins played, this is a jackpot of \$4000.) The payoff schedule being different from table 1 means you play some hands differently, and this means slightly different frequencies of final hands from table 1. A player

Table 3

9-6-800: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	800	0.00248
Straight Flush	50	0.0109
Four of a Kind	25	0.2363
Full House	9	1.1512
Flush	6	1.1015
Straight	4	1.1229
Three of a Kind	3	7.4449
Two Pair	2	12.9279
Pair, Jacks or better	1	21.4585
No Pay	0	54.5435

Payback: 99.54%

using perfect strategy has an edge of 4.6% for the payoff schedule of table 2.

The actual break-even jackpot size for a progressive jackpot on the 8-5 quarter machines analyzed in chapter 2 is 1733 bets for perfect play, or 1752 bets for the usable strategy presented herein. At \$1.25 per pull of the handle, 1752 bets is \$2190, which rounds to \$2200. This is the point at which if you played forever, coins fed in would approximately equal payoffs received. At jackpots higher than \$2200, you have an edge.

Your expected loss per hour while waiting for a royal flush depends on the level of the jackpot. At the break-even point it is 5.4%, and it increases as the jackpot increases and you change strategy to try harder for a royal. At a jackpot of 3200 (\$4000 for five quarters), the loss rate between royal flushes is 5.6%.

Tables 3 through 11 contain some of the more common payout schedules found in Nevada and Atlantic City, and the frequencies of the various hands if the machines are played using perfect strategy.

Many Atlantic City flat-tops have the payoff schedule of table 9. This schedule differs from table 1 by paying 800 for a royal flush, 6 for a full house, and 5 for a flush. Lowering the payment on the royal flush by 200 gives the casino 0.5%. Lowering the payment on a full house by 3 gives the casino another 3.4%. Lowering the payment on a flush by 1 gives the casino another 1.1%. You are expected to lose at the rate of 5.0% if you are so foolish as to play these Atlantic City flat-

Table 4

9-6-250: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	250	0.00194
Straight Flush	50	0.0106
Four of a Kind	25	0.2363
Full House	9	1.1503
Flush	6	1.1987
Straight	4	1.1019
Three of a Kind	3	7.4367
Two Pair	2	12.8987
Pair, Jacks or better	1	21.3907
No Pay	0	54.5742

Payback: 98.37%

tops; and you must play them perfectly to lose at only 5.0%.

Atlantic City also has progressives that pay 6 for a full house and 5 for a flush; strategy for these machines is presented in chapter 4.

Rate of Play

How fast you play depends on how much practice you get, how coordinated you are, and what kind of machine you are playing. Credit machines are faster than machines into which you must hand-feed five coins each play.

500 hands an hour is a reasonable rate to use for planning purposes. The pros play faster than that. With practice you too probably will play faster than 500 hands per hour. I do not know the upper limit; people have written to me that they have clocked 800 hands per hour.

If you play 500 hands per hour, which is not difficult, you should average one royal flush per 62 hours of video poker. This is a long-run average; it does not mean one royal flush in every 62 hours of play. You might hit two royal flushes on the same day or you might play for hundreds of hours without hitting a single royal.

Marginal Win Rate

500 hands an hour on a quarter machine means feeding the machine \$625 per hour. On dollar machines you feed in \$2500 an hour.

Table 5

8-5-1000: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	1000	0.00274
Straight Flush	50	0.0109
Four of a Kind	25	0.2356
Full House	8	1.1490
Flush	5	1.1023
Straight	4	1.1291
Three of a Kind	3	7.4206
Two Pair	2	12.8981
Pair, Jacks or better	1	21.3517
No Pay	0	54.6999

Payback: 97.81%

There is a very important thing to realize about video poker: Your expected result is to lose steadily between royal flushes. This is true whether you are playing with an edge or not. If you are playing a break-even situation, your wins on royal flushes should, in the long run, exactly cover your losses between hitting royals. If you are playing with an edge, you still are expected to lose between royals, but your wins on royals should more than cover your losses between royals.

There is no video poker system that makes you a winner without hitting a royal. Between royals, your expectation is to lose, period. This book does, however, help you cut your losses between royals as much as possible. Someone who plays video poker poorly is expected to lose more money between royals.

On the 8-5 quarter machines common in Nevada, a reasonable estimate of the loss rate while waiting for a royal flush is \$35 an hour. In the 6-5 quarter machines common in Atlantic City, a reasonable estimate of the loss rate while waiting for a royal flush is \$50 an hour. Each \$1000 in the jackpot is worth about 2.5%, or \$16 an hour.

For 8-5 dollar machines into which you must insert five dollars to be eligible for the jackpot, the break-even point is a jackpot of about \$8800 and each additional \$1000 in the jackpot adds about 0.64% to your expected win rate. Playing 500 hands an hour on the dollar machine means betting \$2500 an hour, and 0.64% of that is \$16 per hour.

Table 6
8-5-800: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	800	0.00249
Straight Flush	50	0.0108
Four of a Kind	25	0.2363
Full House	8	1.1514
Flush	5	1.0902
Straight	4	1.1235
Three of a Kind	3	7.4463
Two Pair	2	12.9298
Pair, Jacks or better	1	21.5071
No Pay	0	54.5022

Payback: 97.30%

Thus each \$1000 of the royal-flush payoff adds the same \$16 an hour to your expected hourly win rate whether you are playing 8-5 progressives, 6-5 progressives, or some other payoff schedule, and whether you are playing for quarters, dollars, or some other denomination. Of course jackpots on dollar machines sometimes rise many thousands of dollars above the break-even point, whereas jackpots on quarter machines seldom rise above \$5000.

On 8-5 dollar machines, you probably will lose at a rate of about \$140 an hour while trying for the royal. On 6-5 dollar machines, the waiting loss rate is about \$200 an hour.

To figure out your expected win per hour, just follow the above examples. First, figure out how fast you are expected to lose per hour while waiting for a royal flush. Then divide the jackpot by 1000 and multiply by 16 to get the value per hour of the jackpot. The amount by which the latter exceeds the former is your expected win per hour.

Here is an example. In July of 1988 in the Westward Ho casino in Las Vegas, I saw a bank of 8-5 quarter machines with a progressive jackpot of just over \$2850. There were 24 slot machines connected to that jackpot, and I was surprised to see that not a single one of those machines was in use on the afternoon of my visit! The value of the jackpot was 2.85 times \$16, or more than \$45 an hour; and I would have lost at the rate of \$35 an hour before hitting it. The net is my time would have been worth more than \$10 an hour had I stopped to play those machines.

Table 7
8-5-250: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	250	0.00199
Straight Flush	50	0.0105
Four of a Kind	25	0.2366
Full House	8	1.1520
Flush	5	1.1340
Straight	4	1.1345
Three of a Kind	3	7.4487
Two Pair	2	12.9198
Pair, Jacks or better	1	21.5199
No Pay	0	54.4421

Payback: 96.06%

Another way to do the calculation of expected win per hour is to subtract the break-even jackpot from the actual jackpot, divide by 1000, and multiply by 16. For example, playing a quarter machine with a jackpot of \$2850, which is \$650 above break-even, means expecting to win 0.65 times \$16 or more than \$10 per hour.

Risk While Waiting For a Royal Flush

The biggest component of the risk is royal flushes; your outcome is dominated by the number of them that you receive. The next biggest component is fours-of-a-kind; how many of them you get is the next most important factor in explaining how your actual result differs from your expected result.

The most common expression of risk is standard deviation. Let us start by ignoring royal flushes. For the 8-5 machines discussed in chapter 2, the standard deviation is about 1.82 bets per play while waiting for a royal flush. For the 6-5 machines common in Atlantic City, the single-pull standard deviation is about 1.74 bets.

To find the standard deviation for more than one pull of the handle, multiply the single-pull standard deviation by the square root of the number of pulls you want. For example, one hour means 500 pulls of the handle, and the square root of 500 is 22.4. On 8-5 machines the standard deviation for one hour of play without royal flushes is about 41 bets, or about \$51 for quarter machines. For 6-5 machines, the standard de-

Table 8

6-5-1000: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	1000	0.00278
Straight Flush	50	0.0110
Four of a Kind	25	0.2354
Full House	6	1.1483
Flush	5	1.1051
Straight	4	1.1347
Three of a Kind	3	7.4131
Two Pair	2	12.8878
Pair, Jacks or better	1	21.3328
No Pay	0	54.7291

Payback: 95.51%

viation for one hour of play without royals is about 39 bets, or about \$49 for quarter machines.

In summary, on quarter 8-5 progressive video-poker machines you are expected to lose at the rate of about \$35 an hour while waiting for a royal flush, and the standard deviation applicable to that number is \$51. On quarter 6-5 progressive video-poker machines, you are expected to lose at the rate of about \$50 an hour while waiting for a royal flush, and the standard deviation on that number is \$49. Expected loss goes up with the number of hours, and standard deviation goes up with the square root of the number of hours.

Overall Risk

By far the most important component of overall risk is the payoff for a royal flush. So dominant is it that you can ignore everything else except the number of plays. That is, the overall standard deviation depends on the size of the royal-flush jackpot only, and not on the payoffs for other hands and not on the denomination of coins used.

The overall standard deviation for one pull of the handle is approximately equal to the jackpot times the square root of the probability of hitting it. Thus the overall standard deviation for one pull is equal to about 0.57% of the jackpot. For example, if the jackpot is \$4000, the overall standard deviation on one pull of the handle is about \$23.

To express overall standard deviation as dollars for an hour of play, multiply the per-pull standard deviation by the square root of the number of pulls per

Table 9

6-5-800: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	800	0.00249
Straight Flush	50	0.0108
Four of a Kind	25	0.2362
Full House	6	1.1511
Flush	5	1.0911
Straight	4	1.1283
Three of a Kind	3	7.4429
Two Pair	2	12.9250
Pair, Jacks or better	1	21.5052
No Pay	0	54.5068

Payback: 95.00%

hour. Thus the overall standard deviation on one hour of 500 pulls is about 12.65% of the jackpot. For a jackpot of \$4000, the overall standard deviation is about 12.65% of \$4000, or \$506 per hour.

When you play for quarters, you might find jackpots of \$4000 or so, but seldom will you encounter a jackpot above \$5000. So \$500 seems like a reasonable estimate of the overall standard deviation for an hour's play on quarter machines. For longer plays, the standard deviation applicable to your winnings on quarter machines is about \$500 times the square root of the number of hours you play. After 1000 hours of quarter play for jackpots of \$4000 and up, the standard deviation applicable to your total win is around \$16,000. Jackpots of \$4000 and up mean an expected hourly win rate of \$30 or so. So after 1000 hours of quarter video poker with jackpots of \$4000 and up, your total expected win is about \$30,000 and the standard deviation on that number is about \$16,000.

The numbers in the above paragraph suggest that playing video poker is almost as risky as playing blackjack. A bankroll of about \$10,000 is appropriate for trying to make a living playing quarter video poker. For machines requiring five dollars, your bankroll ought to be four times as high.

Average Winnings Per Hour

The size of the jackpot at any instant can be used to find the win rate at that instant. But for a progressive jackpot, that is not the same thing as the average you can expect to make per hour if you play until the jackpot is hit. On average you will make more than the

Table 10

6-5-250: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	250	0.00199
Straight Flush	50	0.0105
Four of a Kind	25	0.2365
Full House	6	1.1517
Flush	5	1.1350
Straight	4	1.1392
Three of a Kind	3	7.4454
Two Pair	2	12.9150
Pair, Jacks or better	1	21.5185
No Pay	0	54.4462

Payback: 93.76%

instantaneous win rate, because if nobody hits a max-coin royal flush right now, the jackpot will increase.

Which reminds me: Always play the maximum coins. No matter how large the five-coin jackpot gets, you cannot win it if you insert only four coins. One time when I was trying to win a \$5000+ jackpot on one of the quarter machines in the northwest corner of Harrah's Tahoe, the woman next to me groaned, "I think I made a mistake." I looked over to see that she had a four-coin royal flush. Knowing that she had been playing the full five coins hand after hand for many hours, I asked her how she had made such a mistake. She answered that her husband advised her to quickly push the "deal" button rather than wait for the machine to deal automatically. That would be harmless except that sometimes a coin would fall through to the tray instead of staying in the machine. When that happened, she played for four coins instead of five. I was unable to convince her that her husband had given her bad advice.

Meanwhile, back to the topic. To figure out your average win rate from this instant until the jackpot is hit, you need to know how fast the jackpot increases. Some machines, such as the ones mentioned in the above paragraph, are set to have the jackpot increase by a penny for each two quarters played. A penny per fifty cents is 2%. That is the most generous I have seen, but I have been told that years ago some machines were set to have the jackpot increase by 4% of the amount played. More common nowadays is to find 1% machines — the jackpot increases by a penny for each

Table 11

10s, 9-6-1000: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	1000	0.00300
Straight Flush	50	0.0114
Four of a Kind	25	0.2332
Full House	9	1.1391
Flush	6	1.1085
Straight	4	1.3226
Three of a Kind	3	7.3160
Two Pair	1	12.7417
Pair, Tens or better	1	25.1284
No Pay	0	50.9962

Payback: 91.41%

four quarters played. Not all machines are that generous. Some increase at a miserly penny per eight quarters (0.5%) or worse.

A recent development at some casinos is for jackpots to increase by one amount until reaching a particular level, and thereafter increasing by a smaller amount.

If you are the only person playing the machines, you can count how many coins you have to put in between increases in the jackpot. If several people are playing, you can estimate how fast coins are being inserted and how fast the jackpot is rising. For example, if there are an average of eight machines in use by people playing about 500 hands an hour each, the bank of machines is getting about \$5000 of play per hour; if those machines are set to increase the jackpot by 1% of play, the jackpot will increase by about \$50 an hour.

On average, the jackpot will last for another 32,000 or so plays. On quarter machines that means another \$40,000 or so of coins inserted. Thus the jackpot on a 1% machine will on average be hit at \$400 higher than it is right now. On 0.5% machines, the jackpot will be hit at an average of \$200 higher than it is right now. On 2% machines, the jackpot will be hit at an average of \$800 higher than it is right now.

To find your expected average win from now until the jackpot is hit, simply add the average increase to the present jackpot. Suppose you play 500 hands an hour so each additional \$1000 of jackpot is worth an additional \$16 per hour to you. If you are playing a 1%

machine with its \$400 average increase in the jackpot, your expected average win per hour from now until the jackpot is hit is \$6.40 higher than your instantaneous expected win per hour. For example, suppose the jackpot right now is \$3200. That is \$1000 above the break-even point, so you figure your time is worth \$16 an hour right now. If the increment is 1% and you stay until the jackpot is hit, your expected average win per hour is about \$22.40.

If you are lucky enough to find a 2% machine, your average expected win per hour is \$12.80 higher than your instantaneous rate.

On machines into which you must insert five dollars to be eligible for the jackpot, the numbers are four times as high. For example, the expected average win per hour on a 1% dollar machine is \$25.60 per hour higher than the instantaneous rate.

Details of Strategies

Chapter 2 presents a usable strategy for the most common beatable video-poker machines in Nevada. Chapter 3 presents the details from which the material in chapter 2 is derived. Chapter 4 presents a usable strategy for the most common beatable machines in Atlantic City, and a usable strategy for progressive machines paying on a pair of 10s. Chapter 4 also covers video-poker tournaments, double jackpots, bonuses for certain royal flushes, double-down options, and the second-chance option.

CHAPTER 2

8-5 PROGRESSIVE STRATEGY

This chapter presents basic strategy for the video-poker machines currently most played by the pros, the 8-5 progressives. These machines pay a progressive jackpot for a royal flush; if the machine you are contemplating does not offer a progressive jackpot for a royal flush, it is not the type of machine covered by this chapter. 8-5 progressives are most easily distinguished in that they return eight times your bet for a full house and five times your bet for a flush; hence the 8-5 in the name. The full payout schedule for 8-5 progressives is as shown in table 12.

Table 12

Payoffs on 8-5 Progressives

<i>Hand</i>	<i>Payoff Per Coin Bet</i>
Royal Flush	progressive jackpot
Straight Flush	50
Four of a Kind	25
Full House	8
Flush	5
Straight	4
Three of a Kind	3
Two Pair	2
Pair, Jacks or Better	1

Not all video-poker machines have that payoff schedule. If the payoffs offered for various card combinations are different from table 12, the strategy of this chapter does not apply. Payoff schedules different from table 12 are discussed in chapter 4.

Break-Even Points and Win Rates

The break-even royal-flush jackpot for 8-5 progressive video poker machines with the strategy explained in this chapter is 1752 times the number of dollars required per pull of the handle to be eligible for the royal-flush jackpot. This assumes of course that you insert the maximum five coins before you ask for cards.

The most common video-poker machines today require you to insert five quarters to be eligible for the jackpot. For these machines, the break-even point is 1752 times \$1.25, or \$2190, which rounds to \$2200. You probably will lose at a rate of about \$35 an hour while waiting for a royal flush.

The next-most-common machines are those requiring five dollars to be eligible for the progressive jackpot; the break-even jackpot on those machines is 1752 times \$5, or \$8760, which I usually round to \$8800. You probably will lose at a rate of about \$140 an hour while waiting for a royal flush.

I have also seen some machines that require three dollars to have a shot at the progressive jackpot; the break-even jackpot on those machines is \$5256. You probably will lose at a rate of about \$84 an hour while waiting for a royal flush.

On fifty-cent machines, the numbers are \$70 an hour and a BEP of \$4380. Some machines require ten quarters; the numbers for them are the same \$70 and \$4380 as for half dollars. On machines requiring \$5

tokens, the numbers are lose at \$700 an hour and a BEP of \$43,800.

The best video poker I personally have seen is jackpots over \$18,500 on 8-5 dollar machines at the bar on the southeast corner of Harvey's at Stateline, Nevada. Twice I have played those machines at that jackpot level, and both times someone else won the jackpot. Those jackpots were almost \$10,000 above the break-even point, which means expected win of almost \$160 per hour. And those are credit machines, meaning winnings are accumulated on a register, and they can be played very fast. A pro would probably get at least 700 hands an hour, meaning an expected win rate of at least \$200 an hour.

Alternatively, you can do the calculation as explained in chapter 1: On an 8-5 machine requiring five dollars, the expected loss rate while waiting for a royal flush is \$140 an hour. A jackpot of \$18,500 is worth \$16 times 18.5 or \$296 an hour. The difference is over \$150 an hour.

When a jackpot gets that high, some casino patrons become so devoted to their machines that they do without some of life's little pleasures such as eating, sleeping, and using the lavatory. After the monster jackpot is hit, the only sound you hear is "clink clink clink" as all the customers collect their credits so that they can go do some of the things they have done without for many hours.

Strategy for 8-5 Progressive

Table 13 has the appropriate strategy for 8-5 progressive machines.

Other terms are the same as used in poker. A flush is five cards all of the same suit. A straight is five cards consecutive in value, with ace counting either high or low; examples of straights are A-K-Q-J-10, 7-6-5-4-3, and 5-4-3-2-A. A straight flush is five consecutive cards all of the same suit. A royal flush is the highest possible straight flush, A-K-Q-J-10 all of the same suit. Full house means three of a kind plus a pair. Trips means three-of-a-kind. High pair means a pair of jacks or better. Low pair means a pair lower than jacks.

I like to carry video-poker strategy in my wallet and maybe you will too, so I reduced table 13 to wallet size at the end of this book. You may reproduce it for your own use.

The way to use table 13 is to examine the cards dealt to see what holdings you might consider, find them in the table, and see which is highest. For example, suppose you are dealt 9-9-8-7-6 of assorted suits. You might hold the 9-9, or you might hold the 9-8-7-6. A draw to a low pair is higher on the table than a draw to four cards “consec no HC,” and thus is the better play of the hand.

Boldface Numbers

The boldface numbers are the numbers of cards held. All the possible one-card holdings are lined up, as are all of the two-card holdings, three-card holdings, etc. This makes it easy to find the particular row that describes the group of cards you are considering holding. For example, suppose you are dealt Q-Q-J-10-9 of assorted suits. Your decision is whether to hold the Q-Q or the Q-J-10-9. Look down the column of two-card holdings to find the row for high pair. Look down the

Table 13

Strategy For 8-5 Progressives

2853		5 SF	
		4 RF	
<hr/>			
6003		5 flush	
4964	3	trips	
4557	5	straight	
3942	4	ss Q-J-10-9	
	3	RF	
<hr/>			
	4	two pair	
	4	SF	
	2	high pair	
	4	flush	
	4	K-Q-J-10	
5640	2	low pair	
5577	4	Q-J-10-9	
4484	4	J-10-9-8	
3246	3	ss Q-J-9	
	2	ss HC-HC	
<hr/>			
5573	4	consec no HC	
5531	3	ss J-10-9	
3656	3	SF 1 gap 1 HC	
3280	3	SF consec no deuce	
	2	ss HC-10	
<hr/>			
	4	ace-high straight	
	3	K-Q-J	
	2	HC-HC	
	1	HC	
	3	SF	
	0	nothing	

Note to table 13:

Never draw to an inside straight except for ace-high, and never draw two cards to A-HC-HC.

Key to table 13:

A	Ace
consec	consecutive
HC	High Card, i.e. A, K, Q, or J. Note that 10 is not a high card.
J	Jack
K	King
Q	Queen
RF	Royal Flush
SF	Straight Flush
ss	same suit

column of four-card holdings to find the row for Q-J-10-9. Holding a high pair is higher on table 13, so it is preferred over holding Q-J-10-9.

Numbers in the Column on the Left

These are the break-even points for deciding between this draw and going for a royal flush. Hereafter, break-even point is abbreviated as BEP. The BEP units are number of dollars in the jackpot, assuming you must insert five quarters. If the number of dollars in the progressive jackpot is higher than the BEP, then the

next-lower royal-flush draw is a better draw. You can find the next-lower royal-flush draw quickly because all those royal-flush draws are underlined. For example, the BEP for pat straight flush (5 SF) is 2853. This means if you are playing a quarter machine and the jackpot is above \$2853, drawing to four of a royal flush is better than holding a pat straight flush. So if your pat straight flush just happens to be K-Q-J-10-9 and the jackpot is above \$2853, your expected win is higher if you discard the 9 and try for a royal flush.

For machines that require other than five quarters, divide the casino's jackpot by the bet required to be eligible for the jackpot and multiply by \$1.25 to get the number to compare with the numbers in the first column of table 13. For example, for machines requiring five dollars, divide the casino's jackpot by four before comparing it with the BEP numbers in table 13. If the machine requires ten quarters or five fifty-cent pieces, divide the casino's jackpot by two.

Table 13 Line By Line

This section explains each line in table 13.

2853 5 SF

This is a pat straight flush, five consecutive cards of the same suit. An example is 9-8-7-6-5 all of hearts. If the quarter jackpot is above \$2853, break up K-Q-J-10-9 of the same suit to draw to four of a royal flush.

When the jackpot is close to the BEP, it does not matter much which play you make. For example, you can round off the \$2853 to \$2900 or a nice even \$3000 if you want. I used \$2900 in my first draft of this chapter,

but then changed my mind and decided to let you do your own rounding off.

If your machine requires other than five quarters for the jackpot, use the appropriate fraction of the jackpot as explained above. For example, if it takes five dollars to qualify for the jackpot, then divide the jackpot by four before comparing with the \$2853 to decide whether to discard the 9 from K-Q-J-10-9. Alternatively, you could compare the actual dollar-machine jackpot with four times \$2853, or \$11,412.

Omitted Hands

Four-of-a-kind does not have a line in table 13. The reason is the proper play of this hand is obvious — hold the four-of-a-kind. Likewise a pat full house and a pat royal flush do not have lines in table 13; the proper play of those hands obviously is hold all five cards. The jackpot will never get large enough to justify breaking up a pat four-of-a-kind or a pat full house. Using table 13 is quicker with these obvious plays omitted.

4 RF

This is a draw to four cards of a royal flush, which in turn is A-K-Q-J-10 of the same suit.

6003 5 flush

A flush is five cards of the same suit. Having the five dealt is lower on table 13 than holding four of a royal flush, so it is always correct to break up a flush to draw one card to try for a royal flush. If the quarter jackpot is above \$6003, holding three cards of a royal flush is better than holding a pat flush. For example, suppose you are dealt K-Q-10-8-3 all of hearts. If the

quarter jackpot is above \$6003, you should discard the 8-3, cross your fingers, and draw two cards to try for a royal flush.

The \$6003 is a weighted average of the BEPs on all possible hands on which you have to decide between holding a pat flush and breaking it up to draw two cards to try for a royal flush. Chapter 4 lists the possible hands and gives the BEP for each. You might round off the \$6003 to \$6000. As for me, I ignore this number because quarter jackpots never seem to get above \$6000.

4964 3 trips

Trips means three of a kind, such as 7-7-7. If the quarter jackpot is above \$4934, then holding three of a royal flush is preferred to holding three of a kind. For example, if you are dealt K-Q-J of hearts and two other kings, draw to the K-Q-J of hearts if the quarter jackpot is above \$4964, and otherwise draw to the K-K-K. You might prefer to round off the \$4964 to a nice even \$5000.

4557 5 straight

A straight is five cards in numerical order, with ace being high or low. Examples of straights are A-K-Q-J-10, J-10-9-8-7, and 5-4-3-2-A. A pat straight is lower on table 13 than four of a royal flush, so it is always correct to break up a pat straight if it contains four cards of a royal flush. If the quarter jackpot is above \$4557, holding three cards of a royal flush is better than standing pat on a straight.

3942 4 ss Q-J-10-9

An example of this hand is Q-J-10-9 of spades. (I tend to use spades in my examples, but I could have said diamonds or hearts or clubs as easily.* This hand is lower on the table than pat flush and pat straight, so if the other card you are dealt happens to be of the same suit or a king or an 8, then standing pat is better than drawing one card to the Q-J-10-9 suited. The 3942 means if the quarter jackpot is above \$3942, throw away the 9 and the junk card to draw to three of a royal flush. You might prefer to round off the \$3942 to \$4000.

3 RF

This is a draw to three of a royal flush. Three-card combinations that fit this description are A-K-Q suited, A-K-J suited, A-K-10 suited, A-Q-J suited, A-Q-10 suited, A-J-10 suited, K-Q-J suited, K-Q-10 suited, K-J-10 suited, and Q-J-10 suited.

4 two pair

Two pair is two pair. Example: 8-8-7-7.

4 SF

This is four of a straight flush. An example is 10-9-8-6 of hearts. If your other card gives you a flush or a straight, hold the pat hand. If your other card gives you a pair, break up the pair and draw one card to try for a straight flush.

2 high pair

High pair means A-A, K-K, Q-Q, or J-J. This is a desirable pair of cards to draw to, but not as desirable as the groups of cards listed higher on table 13. Holding a high pair is better than holding four of a flush or

four of a straight, but not as desirable as holding four of a straight flush or holding three of a royal flush.

Holding a kicker is never a good idea. For example: With A-J-J and two junk cards, the best play is to draw three cards to the J-J.

4 flush

This means drawing to four cards of the same suit. If your four-of-a-suit includes three cards of a royal flush, then draw two to try for the royal. Drawing to four of a flush is not as profitable as drawing to a high pair, but is better than drawing to a low pair. Drawing to four of a flush is better than drawing to four of a straight.

4 K-Q-J-10

This is a draw to K-Q-J-10 of mixed suits. It merits a line all its own because it contains two ways to make a straight and three ways to make a high pair. Note that it is not as profitable as a draw to four of a flush or a high pair or three of a royal flush.

If the other card is a 10, breaking up the pair of 10s is better than drawing to it.

5640 2 low pair

This is a draw to a low pair. Low pair is any pair that is not a high pair. Examples of low pairs: 10-10, 9-9, 8-8, 2-2.

In the play of the cards, there are three differences between low pairs and high pairs. The most frequently-occurring difference is the draw to four of a flush; it is preferred over a draw to a low pair but inferior to a draw to a high pair. A second difference is a draw to K-Q-J-10, which is inferior to a high pair but superior to a

low pair. The third difference is that if the quarter jackpot is above \$5640, drawing to ss HC-HC to try for a royal flush is superior to drawing to a low pair.

Note that the BEP of \$5640 refers only to two high cards of the same suit; it does not refer to a high card and a 10.

5577 4 Q-J-10-9

This is a draw to Q-J-10-9 of mixed suits. It differs from K-Q-J-10 in two ways. Drawing to a low pair is better than drawing to Q-J-10-9 but not better than drawing to K-Q-J-10. And if the quarter jackpot is above \$5577, then drawing to ss HC-HC to try for a royal flush is better than drawing to Q-J-10-9.

Again, note that the BEP refers only to ss HC-HC. It does not refer to ss HC-10.

4484 4 J-10-9-8

This is a draw to J-10-9-8 of mixed suits. It is not as valuable as a one-card draw to Q-J-10-9 because only the jack can be matched to make a high pair. If the quarter jackpot is above \$4484, drawing to ss A-J or to ss K-J to try to make a royal flush is superior to drawing to J-10-9-8. The \$4484 does not apply to three-card draws to ss J-10.

3246 3 ss Q-J-9

This is a draw to Q-J-9 of the same suit. If the quarter jackpot is above \$3246, discard the 9 and draw to the ss Q-J. For quarter jackpots above \$3246, this line is unnecessary and can be deleted from table 13.

2 ss HC-HC

The abbreviations mean holding two high cards of the same-suit. This is another way of saying a draw

to two cards of a royal without the 10. Hands that fit this description are: A-K suited, A-Q suited, A-J suited, K-Q suited, K-J suited, and Q-J suited.

Sometimes you will have a choice between two ss HC-HC combinations in the same hand. The better choice is to discard the ace. For example, if you have to choose between A-K of spades and Q-J of clubs, discard the A-K of diamonds and draw to the Q-J of hearts. The reason for this choice is there are more ways to make a straight starting with the Q-J.

Drawing to two cards of a royal flush is not as profitable as drawing to any pair unless the jackpot gets high enough, as mentioned above. And drawing to two cards of a royal flush is not as profitable as drawing to four of a flush. But drawing to two of a royal flush is better than drawing to four of a straight, except in the cases of K-Q-J-10, Q-J-10-9, and J-10-9-8 as mentioned above.

5573 4 consec no HC

This is a draw to four of a straight that is open at both ends, ranging from 10-9-8-7 to 5-4-3-2. (Higher straights have their own lines in table 13.* If the quarter jackpot climbs above \$5573, then a draw to 10-9-8-7 is inferior to a draw to ss HC-10.

5531 3 ss J-10-9

This is a draw to J-10-9 of the same suit. If the quarter jackpot climbs above \$5531, discarding the 9 and drawing to the J-10 is the correct play.

3656 3 SF 1 gap 1 HC

This is a draw to three cards of a straight flush, providing there is only one one-card gap and a high

card is held. Only three hands fit this description: ss Q-10-9, ss J-10-8, and ss J-9-8.

Two straight flushes must be possible. Hands with a two-card gap such as J-10-7 or two one-card gaps such as J-9-7 do not belong in this category.

If the quarter jackpot climbs above \$3656, then drawing to ss HC-10 is better than drawing to this three cards of a straight flush.

3280 3 SF consec no deuce

This is a draw to three consecutive cards in the same suit, ranging from ss 10-9-8 to ss 5-4-3. Thus this heading is draws that have a chance at three different straight flushes. For example, drawing to ss 5-4-3 can result in straight flushes headed by the 7, the 6, or the 5.

If you have a choice between drawing to three consecutive small cards of one suit and to HC-10 in another suit, go for the royal flush if the quarter jackpot is above \$3280.

2 ss HC-10

This is a draw to a high card and a 10 in the same suit. These hands are A-10 suited, K-10 suited, Q-10 suited, and J-10 suited

4 ace-high straight

This is a draw to any four cards of A-K-Q-J-10 of mixed suits except for K-Q-J-10, which is more valuable since it has two ways to make a straight, and thus has its own line in table 13. The possible draws to four of an ace-high straight are A-K-Q-J, A-K-Q-10, A-K-J-10, and A-Q-J-10.

3 K-Q-J

This is a draw to K-Q-J of mixed suits.

2 HC-HC

This is a draw to two high cards of mixed suits. A reminder: 10 is not a high card because the machine being discussed does not pay on 10-10.

Hands containing an ace and two other high cards of mixed suits are nowhere in table 13 except for a one-card draw to a straight. The reason is drawing to HC-HC is more profitable than drawing to A-HC-HC. Discard the ace to hold more ways to make a straight.

1 HC

This is a draw to a single high card.

3 SF

This is a draw to three cards of a straight flush, except that some such hands are mentioned higher in the table. Examples of hands in this category but not mentioned higher in the table are 10-9-7 of hearts, 9-7-5 of clubs, and 4-3-2 of diamonds.

The only time you need to know how many ways you can make a straight flush containing your three cards is if your hand contains a high card. That is because a draw to three of a straight flush is such a lousy hand that holding a high card or two is better unless you have got at least two ways to make the straight flush.

0 nothing

This line means throw away all five original cards to draw five new cards. This is the best play for a hand with no high card, no pair, no four of a flush, no four of a straight open at both ends, and no three of a straight flush.

Combinations of cards not mentioned above should not be held. For example, except for ace-high straights, for this payoff schedule it never is correct to draw to four of a one-way straight, also known as an inside straight, such as 9-8-6-5. Likewise for this payoff schedule it never is correct to draw to three of a straight except for K-Q-J. And it never is correct to draw to three of a flush unless a straight flush is possible, for this payoff schedule. The reason for the qualifier “for this payoff schedule” is that for video poker with wild cards, it sometimes is correct to draw to these holdings.

Also, do not hold a kicker with a pair or with three of a kind. A 10 is not a high card; do not draw four cards to a 10.

Coming Next

Chapter 3 covers the same material as chapter 2, but in much more detail. If all you want to do is make a living from playing video poker, chapter 2 is all you need. But if you have a question about a particular hand that has been lumped together with other hands in table 13, you should be able to find the answer in chapter 3.

If you do not want more detail about individual hands, then skip chapter 3. Chapter 4 covers certain other payoff schedules, advice on tournaments, double options, second-chance features, and wild cards.

CHAPTER 3

FINE POINTS OF

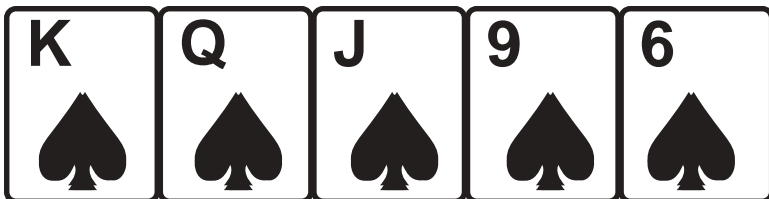
8-5 PROGRESSIVE

STRATEGY

The strategy for 8-5 progressive machines presented in chapter 2 is designed for speed, and is only approximately accurate. This chapter explains the approximations. If by chance you value accuracy over speed you will treasure the material in this chapter, but my guess is you will decide (as I have) that you can tolerate minor playing errors to get in more hands per hour.

Table 14
Breaking a Pat Flush

<i>Cards Held</i>	<i>Cards Discarded</i>	<i>BEP</i>
ss A-HC-HC	ss small-small	\$5979
ss A-HC-10	ss small-small	6111
ss K-Q-J	ss 9-small	5916
ss K-Q-J	ss small-small	5845
ss K-Q-10	ss 9-small	6051
ss K-Q-10	ss small-small	5980
ss K-J-10	ss 9-small	6051
ss K-J-10	ss small-small	5980
ss Q-J-10	ss 9-small	5991
ss Q-J-10	ss 8-small	5920
ss Q-J-10	ss small-small	5849



2853 5 SF

The payoff for a straight flush is 50 bets. With K-Q-J-10-9 suited, the expected value of discarding the 9 and drawing one card to try for the royal is more than 50 bets if the quarter jackpot is over \$2852.50. This is the only BEP in table 13 that is not a weighted average of several different BEPs.

6003 5 flush

The \$6003 is a weighted average of several numbers. The precise BEP for holding a pat flush and drawing two cards to a royal flush depends on the values of cards held. Drawing to K-Q-J has a higher expectation than drawing to A-Q-J because one more straight is possible. Drawing to A-Q-J has a higher expectation than drawing to A-Q-10 because ending up with a high pair is more likely.

The BEP can also be a function of the discards. For example, drawing to Q-J-10 has a higher expectation if the discards are 2-3 than if they are 2-8 because a queen-high straight is less likely if an 8 is discarded.

Table 14 lists the various BEPs that could be used to be more precise on when to draw to three of a straight flush rather than standing pat on a flush. For example, to justify holding A-HC-HC suited and discarding two other cards of the same suit rather than standing pat on the flush, the jackpot should be above \$5979. I have rounded off these BEPs to the nearest dollar. The overall weighted average is \$6003.

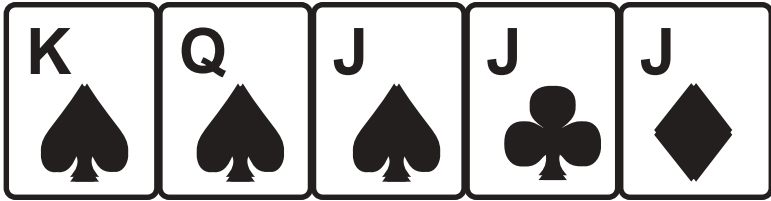


Table 15
Breaking Trips

<i>Cards Held</i>	<i>Cards Discarded</i>	<i>BEP</i>
ss A-HC-HC	HC-HC	\$4964
ss A-HC-10	HC-HC	5106
ss K-Q-J	HC-HC	4832
ss K-Q-10	HC-HC	4975
ss K-J-10	HC-HC	4975
ss Q-J-10	HC-HC	4844
ss A-HC-10	10-10	5006
ss K-Q-10	10-10	4875
ss K-J-10	10-10	4875
ss Q-J-10	10-10	4744

4964 3 trips

The expected value of drawing to three of a kind is 4.24 bets. The expected value of drawing to three of a royal depends on the size of the jackpot of course, but it also depends on which three cards of a royal are held, and whether the trips are high cards or 10s, as shown in table 15. Discarding a high pair means less chance of ending up with a high pair, compared to discarding a pair of 10s. Thus the BEP depends on which three of the royal are contained in the hand and whether the trips are high cards. The weighted average of the BEPs in table 15 is \$4964.

There are two corrections in the 1998 printing of this book. The \$4964 for the first row on page 78 was incorrectly stated as \$4864 in previous printings. Correcting this \$100 error resulted in a \$30 correction in the weighted average because A-HC-HC hands with trips make up 30% of the hands with trips that also contain three cards of a royal; verifying that 30% is a fun exercise left to the reader. This \$30 correction changed the weighted average from \$4934 to \$4964. It is coincidence that both corrections produced the number \$4964.

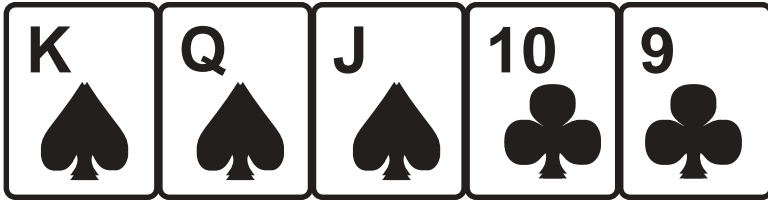


Table 16
Breaking a Pat Straight

<i>Cards Held</i>	<i>Discarded</i>	<i>BEP</i>
ss A-HC-HC	HC-10	\$4557
ss A-HC-10	HC-HC	4696
ss K-Q-J	A-10	4446
ss K-Q-J	10-9	4442
ss K-Q-10	A-J	4585
ss K-Q-10	J-9	4581
ss K-J-10	A-Q	4585
ss K-J-10	Q-9	4581
ss Q-J-10	A-K	4454
ss Q-J-10	K-9	4470
ss Q-J-10	9-8	4446

4557 5 straight

A pat straight is worth 4 bets. Should you break it? The value of drawing to three of a royal flush depends on which three cards are held, whether any of the discards are high cards, and where in the straight the royal-flush cards are located, as shown in table 16. The weighted average BEP is \$4557.

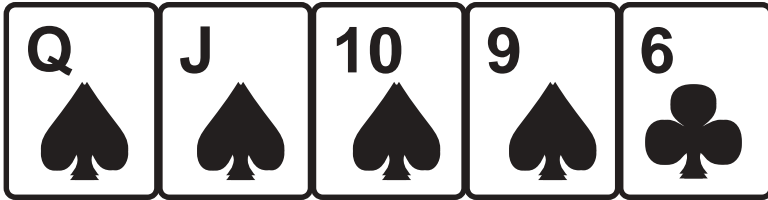


Table 17
Discarding the 9
From ss Q-J-10-9

<i>Fifth Card</i>	<i>BEP</i>
A	\$3952
Q or J	3964
10	3944
9	3969
smaller	3929

3942 4 ss Q-J-10-9

The fifth card originally in this hand is not a king or 8, because such a hand would be evaluated as a pat straight. Likewise the fifth card is not the same suit, because then the hand would be a flush. The BEP for deciding whether to draw one card to try for a straight flush or two cards to try for a royal flush depends on whether the fifth original card is an ace, another high card, a 10, a 9, or a smaller card. The possibilities are listed in table 17. The weighted average is \$3942.

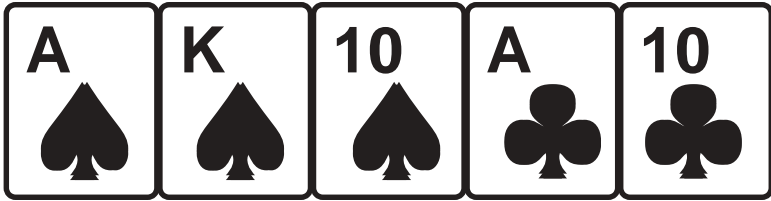


Table 18
Two Pair or Three of a Royal

<i>Cards Held</i>	<i>Discarded</i>	<i>BEP</i>
ss A-HC-HC	no 10	\$2626
ss A-HC-10	no 10	2769
ss A-HC-10	10	2719
ss K-Q-J	no 10	2495
ss K-Q-10	no 10	2638
ss K-Q-10	10	2588
ss K-J-10	no 10	2638
ss K-J-10	10	2588
ss Q-J-10	no 10	2506
ss Q-J-10	10	2456

4 two pair

The expected value of drawing to two pair is 2.51064 no matter what the pair. In video poker, unlike regular poker, a high two pair is worth the same as a low two pair. The BEP for deciding whether to break up two pair to draw to three cards of a royal flush depends on which three of a royal are held and whether a 10 is discarded, as shown in table 18. The weighted average is a jackpot of \$2626. Drawing to two pair is less desirable than drawing to three of a royal flush unless the quarter jackpot is below \$2626, in which case drawing one card to two pair is better.

If you sometimes play video poker with quarter jackpots under \$2626, you can rewrite table 13 with two pair ahead of three of a royal flush, and a BEP of \$2626 in front of two pair.

If a full house pays 6 instead of 8 as in the Atlantic City video-poker machines discussed in chapter 4, the weighted-average BEP is \$2396.

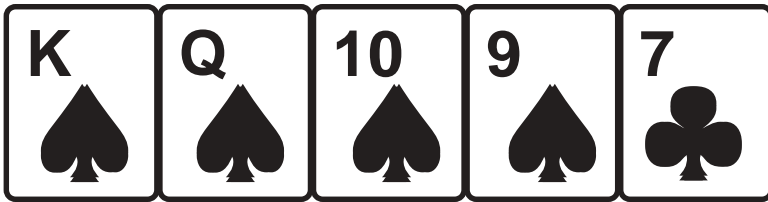


Table 19
Four of a Straight Flush
or Three of a Royal

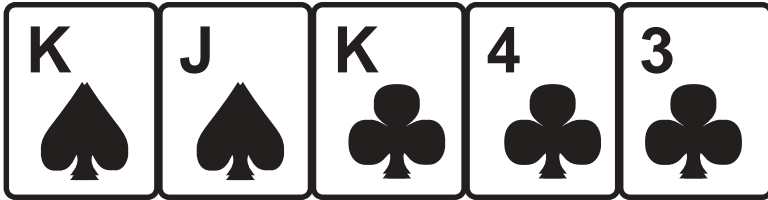
<i>SF Draw</i>	<i>Fifth Card</i>	<i>BEP</i>
ss K-Q-10-9	A	\$2374
ss K-Q-10-9	K or Q	2385
ss K-Q-10-9	10	2365
ss K-Q-10-9	small	2350
ss K-J-10-9	A	2374
ss K-J-10-9	K or J	2385
ss K-J-10-9	10	2365
ss K-J-10-9	small	2350
ss K-Q-J-9	A	2325
ss K-Q-J-9	K or Q or J	2333
ss K-Q-J-9	small	2301
ss Q-J-10-8	A	2247
ss Q-J-10-8	K	2263
ss Q-J-10-8	Q or J	2354
ss Q-J-10-8	10	2234
ss Q-J-10-8	small	2219

4 SF

Drawing to three of a royal flush is more profitable than drawing to four of a straight flush if the progressive jackpot is high. For low jackpots, drawing to four of a straight flush might be preferred. The BEP for Q-J-10-9 suited is 3942, which is high enough that I gave that hand a line of its own in table 13. For other draws to four of a straight flush, the BEPs are smaller than any jackpots I expect you to be playing; so I did not give them lines of their own. They are listed in table 19.

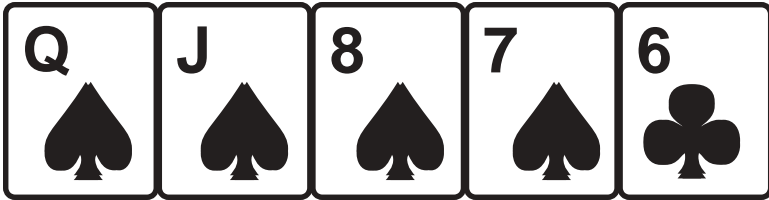
Here is an example of the meaning of the numbers in table 19: If you are dealt $K♥-Q♥-10♥-9♥-A♠$, and the quarter jackpot is above \$2374, try for a royal by holding only the $K♥-Q♥-10♥$ rather than holding the $9♥$ with it and drawing for a straight flush.

For impossibly high jackpots, drawing to two of a royal might be preferred over drawing to four of a straight flush. For example, with Q-J-9-8 suited and a small card of another suit, holding the Q-J suited is preferred if the jackpot is above \$35,968, a jackpot that just is not going to happen on a quarter video-poker machine.



2 high pair

Likewise for jackpots so large they never happen, it might be advisable to break up a high pair to draw to two of a royal flush. An example is: Holding $K\heartsuit$ - $J\heartsuit$ and discarding a king and two small cards of another suit can be justified if the jackpot is above \$21,375. But jackpots do not get that high on quarter video-poker machines.



4 flush

If the jackpot gets above \$11,066, drawing to Q-J suited is better than drawing to four of a flush. The chance of a quarter jackpot getting that high is so small that I did not put a number in front of the draw to four of a flush in table 13.

Joel Friedman, who figured out how to get an edge at video poker long before I did, told me he saw a quarter jackpot higher than that once, but it was a special circumstance. On 22 November 1982 Joel visited the Playboy casino in Atlantic City to play a bank of five-coin dollar 6-5 video poker machines with a jackpot over \$31,000. Joel found that those machines had been replaced by five-coin quarter machines. The monster jackpot was carried over, and Joel could try for it for five quarters instead of five dollars.

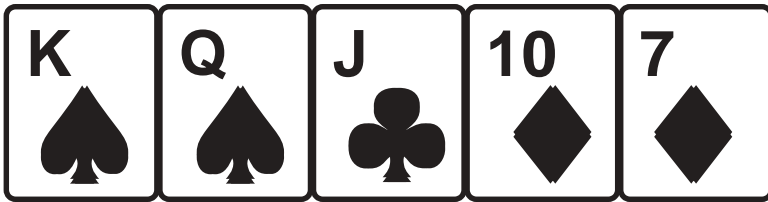


Table 20
K-Q-J-10 or Two of a Royal

<i>Cards Held</i>	<i>Fifth Card</i>	<i>BEP</i>
ss K-Q	small	\$7033
ss K-J	small	7033
ss Q-J	8	6802
ss Q-J	smaller	6742
ss K-10	small	9752
ss Q-10	8	9521
ss Q-10	smaller	9461
ss J-10	8	9230
ss J-10	7	9170
ss J-10	smaller	9090

4 K-Q-J-10

The value of drawing to K-Q-J-10 of assorted suits is 0.87234 bets. If the jackpot gets high enough, drawing to two of a royal flush is better than drawing to four of a straight.

Table 20 lists the BEPs for breaking up this hand to draw to two of a royal flush, assuming that all three discards are of suits different from the two of the royal. If one of the discards is the same suit as the cards held, the BEP is higher by \$281.

The BEPs in table 20 are so high that I have not bothered to figure the weighted average for inclusion in table 13.

5640 2 low pair

The value of drawing to a low pair is 0.8135 bets. This is less than the value of drawing to K-Q-J-10 of assorted suits, which is why if you are dealt K-Q-J-10-10 you should hold K-Q-J-10.

Drawing to ss HC-HC is more attractive than drawing to a low pair if the jackpot gets high enough. Finding the weighted average of all possible hands that have this choice is complicated. The BEP depends on the value of the higher of the two high cards held because the higher it is, the fewer straights are pos-

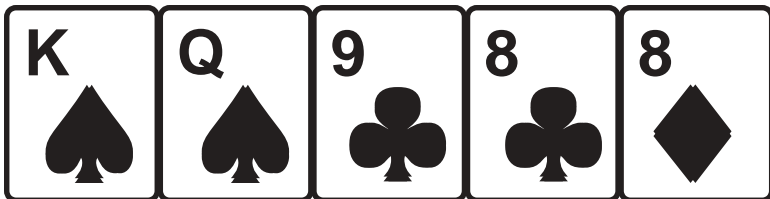


Table 21
Low Pair or ss HC-HC

<i>Hold</i>	<i>Discard</i>	<i>BEP</i>
ss A-HC	HC-10-10	\$6117
ss A-HC	HC-small-small	5997
ss A-HC	10-10-small	5942
ss A-HC	10-small-small	5862
ss A-HC	small-small-small	5782
ss K-Q	A-10-10	5906
ss K-Q	A-9-9	5786
ss K-Q	A-small-small	5626
ss K-Q	J-9-9	5826
ss K-Q	J-small-small	5706
ss K-Q	10-10-9	5771
ss K-Q	10-10-small	5731
ss K-Q	10-9-9	5691
ss K-Q	10-small-small	5571
ss K-Q	9-9-small	5571
ss K-Q	9-small-small	5491
ss K-Q	small-small-small	5411
ss K-J	A-10-10	5906
ss K-J	A-9-9	5786
ss K-J	A-small-small	5626
ss K-J	Q-9-9	5826
ss K-J	Q-small-small	5706
ss K-J	10-10-9	5771
ss K-J	10-10-small	5731

Table 21 continued

<i>Hold</i>	<i>Discard</i>	<i>BEP</i>
ss K-J	10-9-9	5691
ss K-J	10-small-small	5571
ss K-J	9-9-small	5571
ss K-J	9-small-small	5491
ss K-J	small-small-small	5411
ss Q-J	A-10-10	5695
ss Q-J	A-9-9	5575
ss Q-J	A-8-8	5415
ss Q-J	A-small-small	5255
ss Q-J	K-9-9	5615
ss Q-J	K-8-8	5495
ss Q-J	K-small-small	5335
ss Q-J	10-10-9	5600
ss Q-J	10-10-8	5560
ss Q-J	10-10-small	5520
ss Q-J	10-9-9	5520
ss Q-J	10-8-8	5340
ss Q-J	10-small-small	5280
ss Q-J	9-9-8	5400
ss Q-J	9-9-small	5360
ss Q-J	9-8-8	5320
ss Q-J	9-small-small	5200
ss Q-J	8-8-small	5200
ss Q-J	8-small-small	5120
ss Q-J	small-small-small	5040

sible. The BEP also depends on which cards are discarded. Discarding one of the same suit reduces the probability of a flush, and possibly reduces the probability of a straight flush. Discarding one or more cards high enough to fit into a straight reduces the probability of a straight. For example, the BEP for deciding whether to draw to a low pair or to Q-J suited depends on how many 10s, 9s, and 8s are discarded, whether an ace or king is discarded, and which if any of the discards is the same suit as the Q-J.

I have worked out all the possible hands involving decisions between drawing to a low pair and drawing to ss HC-HC. The weighted-average BEP is \$5640. Some of the possible hands are listed in table 21. Those listed are for discards of different suits from the ss HC-HC. You can recreate the rest of the BEPs yourself by adding amounts that depend on which of the discards is the same suit as the ss HC-HC. If the discards reduce the number of possible straight flushes by two, the BEP is higher by \$384. If the discards reduce the number of possible straight flushes by one, the BEP is higher by \$333. If the discards contain one of the same suit as the ss HC-HC but that card does not fit into a straight flush, the BEP is higher by \$281.

Note that this \$5640 applies only to ss HC-HC. It does not apply to ss HC-10. The average BEP for that draw is much higher — probably over \$8000.

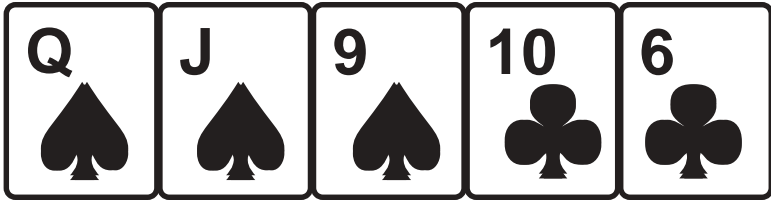


Table 22
Q-J-10-9 or ss HC-HC

<i>Hold</i>	<i>5th Card</i>	<i>Discard</i>	<i>ss</i>	<i>BEP</i>
ss A-HC	ace	9		\$6252
ss A-HC	ace	none		5971
ss Q-J	ace	9		5892
ss Q-J	ace	none		5509
ss Q-J	small	9		5697
ss Q-J	small	small		5595
ss Q-J	small	none		5314

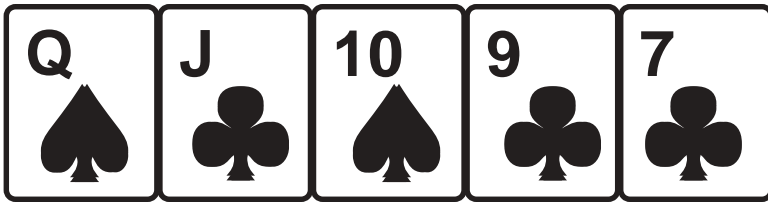


Table 23
Q-J-10-9 or ss HC-10

<i>Hold</i>	<i>5th Card</i>	<i>Discard ss</i>	<i>BEP</i>
ss A-10	ace	9	\$8971
ss A-10	ace	none	8690
ss Q-10	ace	9	8611
ss Q-10	ace	none	8227
ss Q-10	small	9	8416
ss Q-10	small	small	8313
ss Q-10	small	none	8032
ss J-10	ace	9	8371
ss J-10	ace	none	7936
ss J-10	7	9	8236
ss J-10	smaller	9	8176
ss J-10	7	none	7801
ss J-10	smaller	smaller	8022
ss J-10	7	7	8133
ss J-10	smaller	none	7741

5577 4 Q-J-10-9

The expected value of drawing to this holding is 0.80851 bets; so if the fifth card makes a pair, drawing to the pair is better by at least 0.005 of a bet.

The BEP depends on which high cards have the same suit, the value of the fifth card, and whether a third card is the same suit as the ss HC-HC, as shown in table 22. The weighted-average BEP of table 22 is \$5577.

Table 23 lists the BEPs for holding a high card and a 10 of the same suit. These numbers are so high that I have not averaged them into the BEP for Q-J-10-9.

Table 24

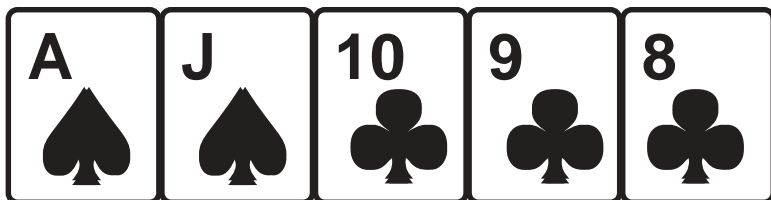
J-10-9-8 or ss HC-J

<i>Hold</i>	<i>Discard ss</i>	<i>BEP</i>
ss A-J	none	\$4482
ss A-J	9 or 8	4764
ss K-J	9	4584
ss K-J	8	4532
ss K-J	none	4251

Table 25

J-10-9-8 or ss J-10

<i>Hold</i>	<i>5th Card</i>	<i>Discard ss</i>	<i>BEP</i>
ss J-10	A	9	\$6882
ss J-10	A	8	6831
ss J-10	A	none	6448
ss J-10	K	9	6942
ss J-10	K	8	6891
ss J-10	K	none	6507
ss J-10	small	9	6667
ss J-10	small	8	6616
ss J-10	small	small	6514
ss J-10	small	none	6232



4484 4 J-10-9-8

The weighted-average BEP of \$4484 applies to draws to the jack and another high card of the same suit. The only possibilities are ss A-J and ss K-J; if you have a queen you have a straight. And of course the BEP depends on whether one of the discards is the same suit. The possibilities are shown in table 24.

Table 25 contains the BEPs for draws to ss J-10. The weighted average BEP for drawing to ss J-10 instead of drawing to J-10-9-8 is \$6580.

Table 13 does not contain a number for drawing to ss J-10 out of a holding of J-10-9-8. The break-even points are so high that table 13 says always draw to J-10-9-8 when the alternative is drawing to J-10 of the same suit.

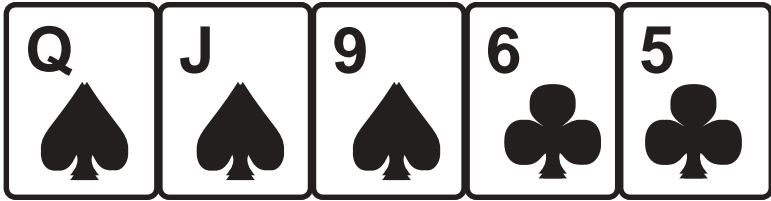


Table 26
ss Q-J-9 or ss Q-J

<i>Discards</i>	<i>BEP</i>
A-8	\$3204
A-small	3444
K-8	2964
K-small	3204
8-small	3045
small-small	3285

3246 3 ss Q-J-9

For low jackpots, drawing to this combination is better than drawing to ss Q-J, as shown in table 26. The BEP is \$3246, the weighted average of the BEPs of table 27.

You can simplify table 13 by omitting this line. The conditional cost of this simplification is 0.005% of the amount by which the jackpot is less than \$3246. For example if the jackpot is \$3000, drawing to ss Q-J instead of to ss Q-J-9 costs only 1.2 cents per hand containing those cards.

Draws to three-card straight flushes with two high cards and gaps of two cards, such as ss Q-J-8, are inferior to draws to two of a royal for all jackpots with positive expectations.

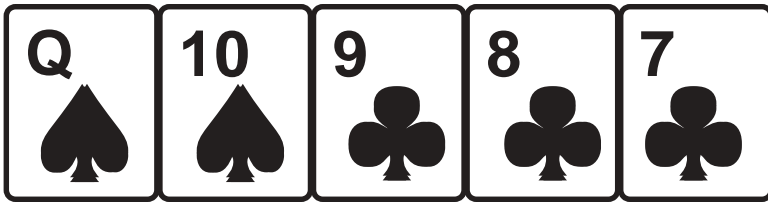


Table 27
10-9-8-7 or ss HC-10

<i>Cards Held</i>	<i>ss discards</i>	<i>BEP</i>
ss A-10	none	\$5692
ss A-10	9 or 8 or 7	5973
ss K-10	none	5401
ss K-10	9	5733
ss K-10	8 or 7	5682
ss Q-10	none	5170
ss Q-10	9	5554
ss Q-10	8	5502
ss Q-10	7	5451

5573 4 consec no HC

Those fours-in-a-row headed by high cards are treated individually. Drawing one card to 4-3-2-ace of mixed suits is not as profitable as drawing four cards to the ace. So this heading relates only to four consecutive cards headed by the 10, 9, 8, 7, 6, or 5. Drawing one card to any of them is worth 0.681 of a bet. Only one of them, 10-9-8-7, is affected by the \$5573; the others cannot possibly contain two cards of a royal flush.

Thus the BEP applies when the four-in-a-row is headed by the 10 and the fifth card is a high card of the same suit as the 10. The BEP is a function of which high card is held with the 10, and which, if any, of the 9-8-7 is the same suit as the HC-10. The BEPs are shown in table 27.

In an early version of this book, the table that is now 27 included ss J-10. That was a mistake because that hand is more valuable as a straight.

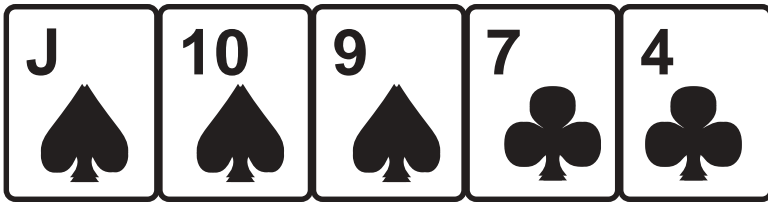


Table 28
ss J-10-9 or ss J-10

<i>Discards</i>	<i>BEP</i>
A-K-9	\$5630
A-9-7	5491
A-9-small	5731
K-9-7	5251
K-9-small	5491
9-7-small	5332
9-small-small	5572

5531 3 ss J-10-9

The BEP for deciding whether to hold J-10-9 of the same suit or just the J-10 depends on whether the discards contain an ace, king, or 7. The break-even points are shown in table 28. The weighted average of those BEPs is \$5531.

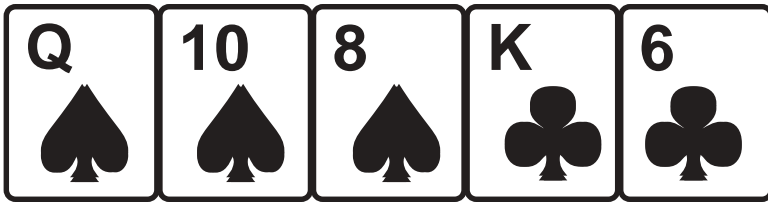


Table 29
Three of a Straight Flush
or ss HC-10

<i>Cards Held</i>	<i>Discarded</i>	<i>BEP</i>
ss Q-10-9	A-K	\$3901
ss Q-10-9	A-8	3762
ss Q-10-9	A-smaller	4002
ss Q-10-9	K-8	3522
ss Q-10-9	K-smaller	3762
ss Q-10-9	8-smaller	3604
ss Q-10-9	small-small	3844
ss J-10-8	A-K	3850
ss J-10-8	A-Q	3610
ss J-10-8	A-7	3391
ss J-10-8	A-smaller	3631
ss J-10-8	K-7	3471
ss J-10-8	K-smaller	3711
ss J-10-8	Q-7	3231
ss J-10-8	Q-smaller	3471
ss J-10-8	7-smaller	3232
ss J-10-8	small-small	3472

3656 3 SF 1 gap 1 HC

The high card is part of the three-card straight flush.

The value of a high card is slightly more than the value of having one more way to make a straight. For example, the value of drawing to ss J-9-8 is about 0.003 of a bet higher than the value of drawing to ss 10-9-8. In other words, a gap in a possible straight is a negative that is canceled out by the presence of a high card.

The three holdings that are three of a straight flush with one gap and one high card are ss Q-10-9, ss J-10-8, and ss J-9-8. Only the first two contain possible three-card draws to ss HC-10. The BEPs depend on the values of the discards, and are shown in table 29. The weighted average of these BEPs is \$3656.

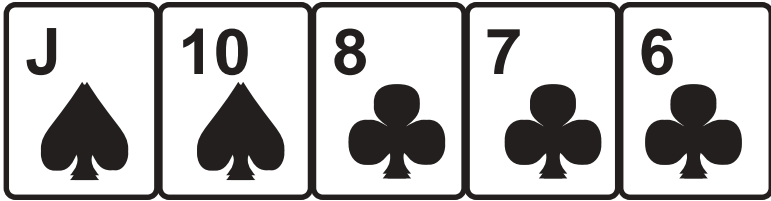


Table 30
Three Consecutive ss
or ss HC-10

<i>3-card ss</i>	<i>ss HC-10</i>	<i>BEP</i>
ss 8-7-6	ss K-10	\$3259
ss 8-7-6	ss Q-10	2967
ss 8-7-6	ss J-10	2736
ss 7-6-5	ss J-10	2896
ss 6-5-4	ss A-10	3930
ss 6-5-4	ss K-10	3559
ss 6-5-4	ss Q-10	3187
ss 6-5-4	ss J-10	2816
ss 5-4-3	ss A-10	3630

3280 3 SF consec no deuce

The highest hand in this category is ss 10-9-8, and the lowest is ss 5-4-3. The value of drawing to this group of cards is at most 0.597 bets; that value comes when the discards contain no high cards and no cards that could fit into a straight. Thus drawing two cards to try to make a straight flush is not as profitable as most video poker beginners seem to think.

Table 30 contains the distinguishably different hands in which you have to choose between ss HC-10 and three consecutive cards in another suit. The weighted average BEP is \$3280.

The hand ss 4-3-2 is not included in this category because \$3280 grossly overstates its BEP. The BEP for ss 4-3-2 is \$1661 or less; the \$1661 applies when the other two cards are ss A-10.

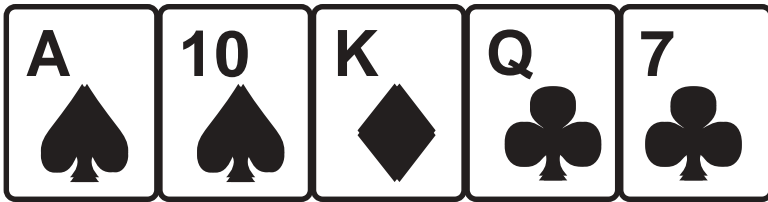


Table 31
Four of Ace-High Straight
or ss HC-10

<i>Cards Held</i>	<i>Discards</i>	<i>BEP</i>
ss A-10	HC, HC, ss small	\$2635
ss A-10	HC, HC, offsuit small	3084
ss K-10	A, HC, ss 9	3185
ss K-10	A, HC, ss smaller	3074
ss K-10	A, HC, offsuit 9	2852
ss K-10	A, HC, offsuit smaller	2792
ss Q-10	A, K, ss 9	2945
ss Q-10	A, K, ss 8	2834
ss Q-10	A, J, ss 8	2894
ss Q-10	A, K, ss smaller	2702
ss Q-10	A, J, ss smaller	2782
ss Q-10	A, K, offsuit 9	2561
ss Q-10	A, K, offsuit 8	2501
ss Q-10	A, J, offsuit 8	2561
ss Q-10	A, K, offsuit smaller	2421
ss Q-10	A, J, offsuit smaller	2501
ss J-10	A, K, ss 8	2594

Table 31 continued

<i>Cards Held</i>	<i>Discards</i>	<i>BEP</i>
ss J-10	A, Q, ss 8	2654
ss J-10	A, K, ss 7	2463
ss J-10	A, Q, ss 7	2542
ss J-10	A, K, ss smaller	2331
ss J-10	A, Q, ss smaller	2411
ss J-10	A, K, offsuit 9	2270
ss J-10	A, K, offsuit 8	2210
ss J-10	A, Q, offsuit 8	2270
ss J-10	A, K, offsuit 7	2130
ss J-10	A, Q, offsuit 7	2210
ss J-10	A, K, offsuit smaller	2050
ss J-10	A, Q, offsuit smaller	2130

4 ace-high straight

This is a draw to an ace plus any three of K-Q-J-10. The expected value of drawing to A-K-Q-J is 0.596, and the expected value of drawing to A-HC-HC-10 is 0.532.

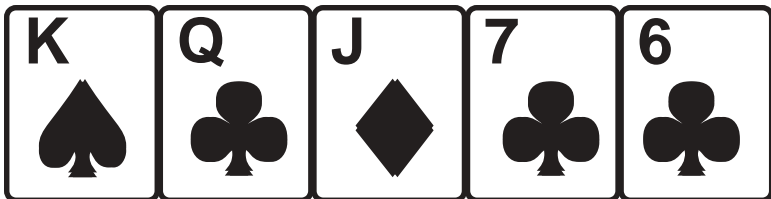
The BEP for deciding between drawing to four cards of an ace-high straight and drawing to ss HC-10 depends on the high card, whether the fifth card is the same suit, and whether that fifth card fits into a straight with the HC-10. These BEPs are shown in table 31.

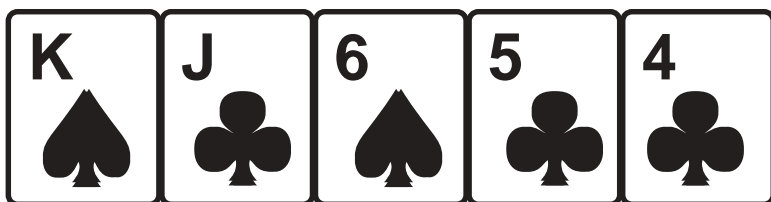
Table 31 reflects two things. First, the value of drawing three cards to try for a royal is almost insensitive to the amount of the jackpot; the expectation rises by only five cents per thousand dollars of jackpot. Second, the smaller the high card held with the 10 the greater the likelihood of making a straight; this means the smallest BEPs are for holding J-10, and the largest BEPs are for holding ace-10.

The weighted-average BEP for ace-high straight is \$2696. If you want to play video poker with jackpots that low, rewrite table 13 with **4 ace-high straight** moved ahead of **2 ss HC-10**, and with the BEP equal to \$2696.

3 K-Q-J

The expected value of drawing to K-Q-J of assorted suits is 0.515 bets if the discards are both smaller than 9, and 0.500 if one of the discards is a 9.





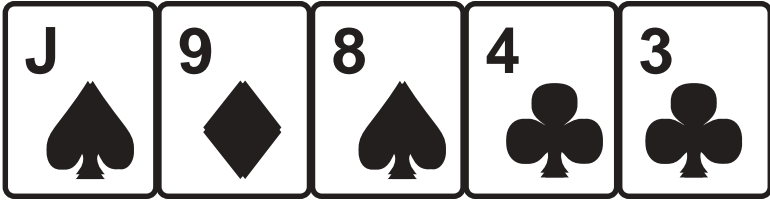
2 HC-HC

The best pair of high cards to hold is Q-J, with K-J and K-Q tied for next best. After that comes a tie between A-K, A-Q, and A-J.

Drawing three cards to K-Q, K-J, or Q-J is better than drawing four cards to a single high card.

With A-K, A-Q or A-J of mixed suits, there is almost no difference between drawing three cards and drawing four cards to the face card. The chance of hitting a royal flush on a four-card draw is worth less than half a cent per \$1000 of jackpot. The decision on whether to draw three cards to A-HC or four cards to the HC depends on what the discards do to the chances for a flush or a straight. While differences do exist, they are so minor that it is not worth spending time pondering them.

When scrutinizing a hand for high cards, look for face cards first. If you have an ace and a face card of a different suit, the important thing is to hold the face card. Whether you hold the ace with it does not matter much. I find I play quicker if I do not worry about off-suit aces.



1 HC

The best high card to hold is a jack. Next best is a queen. Next best is a king. Then comes ace. The reason is the number of straights that can be made with each card.

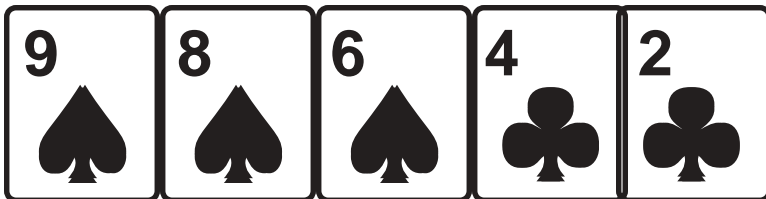
3 SF

Drawing to three cards of a straight flush with one gap and no high cards (example: $9\clubsuit-8\clubsuit-6\clubsuit$) is worth about the same as drawing four cards to a high card or three cards to HC-HC. The differences depend on which high cards are involved, whether the discards are the same suit as the high card, and whether any of the discards fit into a straight with the card or cards held.

Suppose you have the following hand dealt to you: $K\heartsuit-J\spadesuit-7\clubsuit-5\clubsuit-4\clubsuit$. Drawing to the K-J is worth 0.493 times your bet. Drawing to the lonesome jack is worth 0.465 plus .00000449 times the jackpot; for a jackpot of \$4000, the value of drawing to the jack is 0.483 times your bet. The value of drawing to the $7\clubsuit-5\clubsuit-4\clubsuit$ is 0.494 times your bet.

If the example were changed so the high cards were $A\heartsuit-J\spadesuit$, then drawing to the three of a straight flush with one gap would be the best play. If the example were changed so the high cards were $Q\heartsuit-J\spadesuit$, then the best play would be hold the Q-J.

A draw to three cards of a straight flush that has only one way to make a straight (such as ss 9-7-5) is inferior to draws to one or two high cards.



I decided to put the two-card draw to a straight flush below the four-card draw to a high card after playing a lot of video poker. I found that looking for three-card straight-flush draws took too much time. Figuring how many straights were possible took too much time. I was spending too much time sorting out differences in expected values that were too small to worry about. Looking at the high cards and ignoring the low cards makes for faster play. This is the main category of deviation from perfect play.

Cost of Errors

On decisions between holding three of a royal flush and holding anything else, the cost of an error is 74 cents per \$1000 of difference between the actual quarter jackpot and the BEP.

On decisions between holding two of a royal flush and holding anything else, the cost of an error is 5 cents per \$1000 of difference between the actual quarter jackpot and the BEP.

Table 32

6-5-2400: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	2400	0.00314
Straight Flush	50	0.0101
Four of a Kind	25	0.2351
Full House	6	1.1440
Flush	5	1.1176
Straight	4	1.1098
Three of a Kind	3	7.4068
Two Pair	2	12.8517
Pair, Jacks or better	1	21.0460
No Pay	0	55.0758

Payback: 99.79%

CHAPTER 4

OTHER

VIDEO-POKER

STRATEGIES

This chapter presents strategies for other payoff schedules and other options.

Strategy for 6-5 Progressives

Table 32 lists the payoffs for video-poker machines you are likely to encounter in Atlantic City. They pay 6 for a full house and 5 for a flush so I call them 6-5 machines. The machines worth playing have

Table 33

Strategy For 6-5 Progressives

2853	5	SF
	4	RF
<hr/>		
6003	5	flush
4869	3	trips
4557	5	straight
3942	4	ss Q-J-10-9
	3	RF
<hr/>		
	4	two pair
	4	SF
	2	high pair
	4	flush
	4	K-Q-J-10
5622	4	Q-J-10-9
5273	2	low pair
4529	4	J-10-9-8
	2	ss HC-HC
<hr/>		
5618	4	consec no HC
5576	3	ss J-10-9
3701	3	SF 1 gap 1 HC
3325	3	SF consec no deuce
	2	ss HC-10
<hr/>		
	4	ace-high straight
	3	K-Q-J
	2	HC-HC
	1	HC
	3	SF
	0	nothing

Note to table 33:

Never draw to an inside straight except for ace-high, and never draw two cards to A-HC-HC.

Key to table 33:

A	Ace
consec	consecutive
HC	High Card, i.e. A, K, Q, or J. Note that 10 is not a high card.
J	Jack
K	King
Q	Queen
RF	Royal Flush
SF	Straight Flush
ss	same suit

a progressive jackpot for a royal flush. Table 32 has 2400 (which is \$3000 for five quarters) listed as the payoff for a for royal flush because a value has to be specified to be able to calculate frequencies. The break-even point for perfect play is 2468, or \$3085 for five quarters. The break-even point for the strategy presented in this chapter is \$3107, which I round to \$3100.

Table 33 presents the strategy for video-poker machines that have the payoff schedule of table 32, with a progressive jackpot for a royal flush. It differs only slightly from table 13. The only switching of lines from table 13 is swapping a draw to a low pair and a draw to Q-J-10-9. The ss Q-J-9 line is gone because drawing to those three cards is inferior to drawing to ss Q-J for all jackpots above the break-even point. Some of the BEPs in table 33 are slightly different from those of table 13.

The expected loss rate while waiting for a royal flush is about \$50 an hour on quarter 6-5 machines, and the BEP royal flush jackpot is about \$3100. For fifty-cent machines the numbers are double: \$100 an hour and a BEP of \$6200. For dollar machines the numbers are double again: \$200 an hour loss rate waiting for a royal, and a BEP of \$12,400.

Since the BEP for a pat ss K-Q-J-10-9 is \$2853, if you are playing a 6-5 progressive with an edge you ought always throw the 9 from that straight flush and draw one card to try for a royal flush.

Table 33 is reduced to wallet size at the end of this book, along with table 13. You may reproduce either for your own use.

Table 34

10s, 9-6-4000: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Royal Flush	4000	0.00336
Straight Flush	50	0.0101
Four of a Kind	25	0.2279
Full House	9	1.1188
Flush	6	1.1328
Straight	4	1.2352
Three of a Kind	3	7.1375
Two Pair	1	12.5192
Pair, 10s or better	1	25.6422
No Pay	0	50.9730

Payback: 101.02%

Strategy for 10s-or-Better Progressive

Table 34 is the set of payoffs common on progressive video-poker machines that pay for a pair of 10s. A jackpot of 4000 coins (\$5000 for five quarters) is used for the royal flush to find frequencies of the various final hands. These frequencies were found by VP-EXACT.

The BEP for quarter 10s-or-better machines is \$4618 for perfect play on machines requiring five quarters. This is considerably higher than the BEP of \$2166 for perfect play of the 8-5 progressives of chapter 2. The reason is the even money paid for two pair costs a whole lot more than the benefit of getting paid on 10-10. The expected loss rate while waiting for a royal flush on quarter 10s-or-better machines is around \$80 an hour.

For fifty-cent machines, the numbers are \$160 an hour and a BEP of \$9,280. For machines requiring five dollars, the numbers are \$320 an hour loss rate and a BEP of about \$18,560.

Table 35 is the strategy for progressive machines with the payoff schedule of table 34. Table 35 differs considerably from table 13. Abbreviations are the same as for table 13 except that 10 is a HC. The BEP for using this table is \$4640.

If you have J-10-9 of one suit and A-K of another suit and the jackpot is above \$5812 so you would rather hold ss HC-HC than ss J-10-9, you are slightly better off holding the ss J-10 rather than the ss A-K.

Table 35

10s-or-Better Progressives

	4	RF
	5 SF	
5916	5	flush
4937	3	trips
	3	RF
	5 straight	
	4	SF
	4	two pair
	2	high pair
	4	flush
	4	K-Q-J-10
	4	Q-J-10-9
5837	4	J-10-9-8
5812	3	ss J-10-9
	2	ss HC-HC
	4 10-9-8-7	
	3	ss 10-9-8
	4	consec no HC
	2	low pair
	3	SF with HC
	3	SF consec no deuce
	4	ace-high straight
	4	king-high straight
	3	HC-HC-HC no ace
	2	HC-HC no ace
	1	HC
	3	SF
	0	nothing

Notes to table 35:

1. Never draw to an inside straight except for ace-high or king-high.
2. Never draw two cards to A-HC-HC or three cards to A-HC.

Key to table 35:

A	Ace
consec	consecutive
HC	High Card, i.e. A, K, Q, J, or 10
J	Jack
K	King
Q	Queen
RF	Royal Flush
SF	Straight Flush
ss	same suit

Video-Poker Tournaments

Tournament strategy is different from regular strategy for all casino games, including video poker.

If the tournament format rewards speed and you play faster than your opponents, your best chance to advance in the tournament is by playing your normal style.

Generally, however, you are not going to win a video-poker tournament with two pair. You must get lucky and receive big-payoff hands. In a tournament, holding multiple high cards makes sense only if they are all the same suit; if your high cards are of assorted suits, hold just one high card.

Do not try to make other hands that will not help you in the tournament. For example, if straights and flushes will not give you enough points in the tournament, do not make one-card draws to try to complete a straight or flush. If a full house will not help you, do not draw one card to two pair. At the extreme, if the only hand that will win for you is a royal flush, then go for a royal flush on every draw.

Two Jackpots

Some video-poker machines have two jackpots for a royal flush. For the ones that pay the larger of the two jackpots, simply look at the larger jackpot and ignore the smaller one.

Other machines pay whichever of the two jackpots an arrow happens to be pointing toward when you hit. It may be possible to time your jackpot to receive the higher payoff. If you need only one or two cards to make a royal flush, you may be able to time

your draw so that you catch the arrow pointing to the higher jackpot. In some casinos this is easy; for example, in the Frontier in Las Vegas, the arrow seems to point to one jackpot for at least 30 seconds at a time. There is no guarantee that your royal flush will come when the arrow points to the higher jackpot of course; you might get your royal on your first five cards or on a draw of four or five cards. If you do not think you can time your best royal-flush draws to correspond to the higher jackpot, then use the average of the two jackpots for playing strategy and computing the value of your time.

Cards In Order

Some casinos offer a bonus for getting your royal flush with all cards in order. The total number of ways to get a royal flush, paying attention to position and suit, is 480. One royal flush out of 120 is in the order A-K-Q-J-10, and one out of 120 is in the order 10-J-Q-K-A.

If the royal-flush jackpot is worth \$16 per hour per \$1000 of payoff, and the bonus for cards in order left to right or right to left is worth $1/60$ of that much, then the bonus for cards in order is worth 27 cents an hour per \$1000 of bonus payoff. A bonus for cards in order just one way, say left to right, is worth half as much.

Cards In a Particular Suit

There are four suits, and the royal must be in one of them. So if a bonus is offered for a royal in a particular suit, that bonus is worth $1/4$ of the \$16, or \$4 per hour per \$1000 of bonus.

If the royal-flush payoff depends on the suit, i.e. different payoffs for different suits, add the payoffs and divide by four to decide whether the machine is worth playing.

If a bonus is offered for a royal flush in a particular suit with cards in order right to left or left to right, you will get that bonus on one royal flush out of 240. Thus it is worth 7 cents an hour per \$1000 of bonus. A bonus for cards in a specified suit in order left to right is worth half that much.

Double Option

Some video-poker machines offer you an option to go for double or nothing on a winning hand. That option can be worth considering if it involves guessing whether a card drawn from the remainder of the deck is high or low (8s lose), or guessing if it is odd or even (aces lose). On average the house makes 8% on those bets, but if your final hand plus the cards you discard have an excess of five or more cards in one category, then the odds favor your trying to double your payoff.

For example, at the Ambassador (now Anthony's) in Las Vegas I have seen video-poker machines that allow you to guess odd or even to try to double your payoff. Suppose you are dealt 4-6-10-10-10, discard the 4-6, and receive 8-Q. You have three of a kind, which if you have inserted five coins is worth fifteen coins. You have an edge if you opt to go for double because the remaining 45 cards contain 24 winners and only 21 losers if you guess odd. I have not run a simulation to find the overall value of the double option, but since it yields an advantage only rarely and the advantage

generally is small when it does occur, the double option probably is worth less than one percent.

More common is a double-down feature that reshuffles all 52 cards. The first card is the dealer's, and you select one of the other four as your card. If your card is higher than the dealer's card you win, and if the dealer's card beats your card you lose. Ties are replayed. The casino's edge on this form of the double option is zero.

Second-Chance Feature

Some video-poker machines have a "second chance feature." After the draw, if your hand is only one card away from a straight or better, you have the option of inserting more coins and getting one more card.

The payoffs on winning second-chance hands are not the same as what the payoffs would have been had you won on your first chance. You can figure out how good the second-chance feature is. First figure out how many of the cards left in the deck will win each payoff. Then multiply each by the payoff offered. Add them up. If the total is more than the number of cards left in the deck, you have an edge.

For example, suppose that you hold four spades including the jack, and draw a small card of the wrong suit. The second-chance feature then will offer you four times your bet if you make your flush and even money if you draw another jack. Out of 46 cards you have not seen, 9 will complete your flush and 3 are jacks. Multiplying probabilities times payoffs shows

that the casino is giving you 39/46 of your money back, and is keeping the other 15.2% for its edge.

Here is one I saw that is zero edge for the casino. The player held 7-6-5-4 of assorted suits, discarded a 2, and drew a 4. That left 46 cards in the deck. The second-chance feature offered three coins for a straight, and 8 cards remained that would make the straight. Three of a kind would pay two coins, and 2 cards in the deck would make the three of a kind. Two pair would pay two coins, and 9 cards in the deck would make two pair. Multiply all those together and add them up and you find the machine is offering to return 46/46 or 100% of the second-chance bet.

The way I suggest playing the second-chance feature is to ignore it as if it did not exist. On the second-chance payoffs I have worked out, the casino edge has generally been above 10%. I have yet to see a second-chance offering that is a positive expectation for the player.

Wild Cards

Some video-poker machines have jokers. On other machines, deuces are wild. With wild cards it is possible to get five of a kind. The payoff for a royal flush depends on whether the hand contains a wild card.

Tables 36-39 present four different payoff schedules for wild-card video poker, and the frequencies of final hands for perfect play. These frequencies were found by VPEXACT. You can use these frequencies to approximate your edge (if any) for the various payoff schedules you encounter in casinos. Tables 36 and 37 are two different versions of joker wild, table 38 is one

Table 36 Joker, Kings: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Natural Royal Flush	800	0.00243
Five of a Kind	200	0.00933
Royal Flush — Wild	100	0.0104
Straight Flush	50	0.0575
Four of a Kind	20	0.8555
Full House	7	1.5679
Flush	5	1.5577
Straight	3	1.6595
Three of a Kind	2	13.3937
Two Pair	1	11.0873
Pair, Kings or better	1	14.1958
No Pay	0	55.6029

Payback: 100.65%

version of deuces wild, and table 39 is one version of deuces and joker wild.

There are books that give good information on wild-card video poker. Bradley Davis presents accurate playing advice for nineteen different varieties of joker video poker in his *Mastering Joker Wild Video Poker*. Lenny Frome presents accurate playing advice for selected payoff schedules for joker wild, deuces wild, and both joker and deuces wild in his *Expert Video Poker for Las Vegas* and *Expert Video Poker for Atlantic City*. On decisions on which Frome and Davis disagree, Davis is more accurate.

The reason I am able to say with assurance that Frome and Davis have done good work is I checked their advice with computer programs I wrote. One of the programs was originally named *Video Poker Analyzer*. In 1991 Villa Crespo Software upgraded the graphics, added more features, and renamed it *Stanford Wong Video Poker*. With it you can evaluate any video poker game. For any payoff schedule you specify: You can measure the casino's edge, figure out the proper play of any hand, and practice with feedback on how accurately you are playing. My other video poker program, VPEXACT, calculates the overall payback and frequencies of various hands for any set of video poker payoffs you specify.

Some casinos offer wild-card video poker that yields over 100% payback to perfect play. They can afford to do this because most video-poker players play far from perfectly. A caution: The strategies in this book do not apply to wild-card machines.

Table 37 Joker, 2 Pair: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Natural Royal Flush	800	0.00192
Five of a Kind	100	0.00905
Royal Flush — Wild	50	0.00716
Straight Flush	50	0.0594
Four of a Kind	20	0.8072
Full House	8	1.4902
Flush	7	2.2560
Straight	5	2.8254
Three of a Kind	2	12.2713
Two Pair	1	10.3877
No Pay	0	69.8847

Payback: 98.68%

Attitude of Casino Personnel

“Will this book negate any advantage after casino management reacts to it? Are gambling bosses aware of the profitability of video poker to players? Have they taken any countermeasures yet? Do you expect that they will? Are people ever barred from playing video poker? Do you expect phasing out of profitable machines? Do winning players ever experience heat? Isn't it possible that a large proportion of the limited number of profitable machines could be monopolized by a small number of well-financed players?”

The above paragraph includes some of the many questions I have received on the viability of video-poker play. Most of these questions come from card counters who have had unfriendly interactions with blackjack pit bosses. Video poker is different from blackjack in many respects.

Blackjack bosses watch their customers closely because of the possibility of cheating, but there is less the customer can do to cheat at video poker so there is less reason to watch the customers closely. In blackjack your bet sits on the table, and someone has to watch to be sure you do not add to bets on good hands or remove chips from bets on bad hands; in video poker the machine holds your bet so nobody has to watch you to be sure you do not change it. In blackjack the cards are sitting in front of you, and most casinos allow you to handle them yourself; someone has to watch to be sure the cards you place on the table are the same as the cards you are dealt. In video poker, the cards exist

Table 38 Deuces Wild: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Natural Royal Flush	800	0.00221
Four Deuces	200	0.0204
Royal Flush — Wild	25	0.1796
Five of a Kind	15	0.3202
Straight Flush	9	0.4120
Four of a Kind	5	6.4938
Full House	3	2.1229
Flush	2	1.6522
Straight	2	5.6623
Three of a Kind	1	28.4544
No Pay	0	54.6800

Payback: 100.76%

as images on the screen and nobody has to watch to be sure you play the same cards you are dealt.

You may have experienced “heat” (i.e. unwelcome attention) at blackjack simply because you were making bets that were large for that casino. You will not experience heat for that reason at video poker because all customers on your bank of machines are betting the same denomination of coins. If you were one of dozens of blackjack customers betting \$2 every hand, you likely would be ignored. In video poker, you are one of dozens of customers betting \$1.25 every hand.

The main problem with casino employees is competing with them for machines. For example, in 1987 at Caesars Tahoe, many dealers headed for the high-jackpot video-poker machines as soon as they got off work. A Caesars employee would give up a video-poker machine only to another Caesars employee. Patrons of Caesars Tahoe who were not also employees of the casino were not able to play the video-poker machines with high jackpots. This practice continued until a few hotel guests raised such a ruckus that management abolished the common practice of allowing the current user of a machine to decide who would play it next, and set up a waiting line. Caesars continued to allow its employees to play video poker, but they had to wait in line for a machine like other customers.

Whereas a blackjack card counter may be hard to spot unless the person doing the looking is also a card counter, good video-poker players are easier to spot. They are the people who show up only when the jackpot is high. But to my knowledge the only behav-

Table 39 Deuces & Joker: Payoffs & Frequencies

<i>Final Hand</i>	<i>Pay Per Coin</i>	<i>Freq (%)</i>
Five Wild Cards	2000	0.000773
Natural Royal Flush	800	0.00198
Four Deuces	25	0.0149
Royal Flush — Wild	12	0.2801
Five of a Kind	9	0.5508
Straight Flush	6	0.7430
Four of a Kind	3	8.1337
Full House	3	2.6613
Flush	3	2.9022
Straight	2	6.6109
Three of a Kind	1	28.4773
No Pay	0	49.6232

Payback: 99.07%

ior for which customers have been barred from playing video poker is tying up machines so that other customers do not have access to them. Thus if you show up with your spouse and two other couples, and the six of you monopolize a couple of machines 24 hours a day for day after day so that other customers do not have a chance to play them, you are engaging in behavior that has led to barrings in the past.

When a customer has been waiting to play a machine, and sees that machine turned over to a newly-arrived teammate instead, that customer's complaints to management will bring wrath down on the team. There are several ways to avoid this. One is to not try to monopolize a machine; i.e. do not take turns on it with your spouse or a friend if other people are waiting to play it. Another way is to pretend the teammate is a stranger but someone you find attractive; flirt as you are giving up your machine. What customer will complain if you gave up your machine because of sexual attraction? Another possibility is to have your teammate buy the right to play your machine. If your teammate offers you \$50 for your machine, you could look at the stranger and say "This person offered me \$50 for this machine. I'm willing to consider a better offer." Make the price low enough to be believable, but high enough that you would be willing to give up the machine if the stranger offers more.

Would a casino knowingly offer a game in which the customer has an edge? Yes. Some casinos offer big cash prizes on games that are completely free to play! Back in 1984, Matthew Balsam of Denver, Colorado won \$100,000 in cashball, a free game at the Sands in

Las Vegas. The Sands was giving away money, knowingly and willingly. Plaza and El Cortez in Las Vegas have had promotion after promotion that offer cash prizes at no cost to customers. These casinos offer free games with cash prizes to bring people in. Large progressive jackpots also bring people into the casino. Some of those people eat meals, rent rooms, and patronize games of chance. If I ran a casino I would be happy to offer large progressive jackpots at video poker; I would refuse to give information on jackpot sizes over the telephone because I would want you to come in to see for yourself.

LITERATURE CITED

Dancer, Bob. *WinPoker*. Fountain Hills, AZ: Zamzow, 1998.

Davis, Bradley. *Mastering Joker Wild Video Poker*. Aurora, CO: Applied Technology Press, 1990.

Frome, Lenny. *Expert Video Poker for Atlantic City*. Las Vegas: Compu-Flyers, 1989.

Frome, Lenny. *Expert Video Poker for Las Vegas*. Las Vegas: Compu-Flyers, 1990.

Paymar, Dan. *Video Poker — Optimum Play*. Pittsburgh: Conjelco, 1998.

Wong, Stanford. *Stanford Wong Video Poker*. Highland Park, IL: Villa Crespo Software, Inc., 1991.

Wong, Stanford. *VPEXACT*. Las Vegas: Pi Yee Press, 1991.

INDEX

Symbols

10s-or-better progressive 99

6-5 progressive strategy 94-97

8-5 progressive strategy 37-53

A

Amster, Anne 5

attitude of casino personnel 110-115

B

Balsam, Matthew 114

break-even jackpot size 19, 23, 97, 99

C

cards in a particular suit 103-104

cards in order 104

cashball 114

cheating 17

cost of errors 92

D

Dancer, Bob 116

Davis, Bradley 108, 116

double option 104-105

Douglas, Dave 5

E

evaluating payoff schedules 14-21

Expert Video Poker for Atlantic City 108, 116

Expert Video Poker for Las Vegas 108, 116

F

flat-top 15
 flush 41, 66
 frequencies of final hands 14-21, 93, 98, 106
 Friedman, Joel 66
 Frome, Lenny 108, 116
 full house 41

H

hands an hour 21
 high pair 41, 65

I

inside straight 53

J

joker 106-108

K

kicker 48, 53

L

losses between royals 19-21, 23-27, 97, 99
 low pair 41, 68-74

M

Mastering Joker Wild Video Poker 108, 116
 monopolize a machine 112-114

P

pair of high cards 89
 Paymar, Dan 116
 probability of royal 15

R

risk 27-29
 royal flush 41

S

second chance feature 105-106
 Speer, John B. 5
Stanford Wong Video Poker 108, 116
 straight 41
 straight flush 41

T

tournaments 102
 trips 41
 two jackpots 102-103

V

value of royal flush payoff 23
Video Poker — Optimum Play 116
Video Poker Analyzer 108
VPEXACT 15, 99, 106, 108, 116

W

wild cards 106-108
 winnings per hour 31-36
WinPoker 116

ABOUT THE AUTHOR

Stanford Wong is my nom de plume. I was born in 1943. I have a BS and an MBA from Oregon State University, and a Ph.D. in finance from Stanford University. I have taught at several universities, most recently in the 1975-76 school year. I have taught statistics, calculus, linear programming, accounting, and a few finance courses. I have always been an intensely competitive game player, and I like to solve puzzles. I consider myself fortunate that I can spend my time doing things I enjoy doing, and that it pays enough to keep rice on the table.

BOOKS BY PI YEE PRESS

Bryce Carlson's *Blackjack for Blood* discusses counting cards at blackjack. It contains an excellent level 2 counting system.

Tino Gambino's *The Mad Professor's Crapshooting Bible* discusses beating craps. Its strengths are discussions of grips, tosses, practice tips, adjusting to table conditions, dice setting, and betting.

Bob Nersesian's *Beat the Players* describes how the rights of casino customers are abused by casinos and law enforcement. Nersesian is a lawyer who has won many lawsuits brought by customers, particularly advantage players, against casinos.

Stanford Wong's *Wong on Dice* discusses beating craps. It covers rules, sets, gripping, and tossing. Its strengths are practice tips and advice on dice setting and betting.

Stanford Wong's *Casino Tournament Strategy* explains how to get an edge over the other players in

casino-games tournaments. It covers blackjack, craps, baccarat, keno, and horses.

Stanford Wong's *Professional Blackjack* has a complete and accurate presentation of the *high-low*, the counting system used by more card counters than any other because of its combination of simplicity and power. If you want a more advanced counting system, *Professional Blackjack* also contains the *halves*.

Stanford Wong's *Blackjack Secrets* explains how to get away with playing a winning game of blackjack in casinos. It also contains an introduction to the high-low card counting system.

Stanford Wong's *Basic Blackjack* is a comprehensive presentation of basic strategy and win rates for all common rules and most exotic rules for the game of blackjack. It also explains methods of getting an edge that do not involve counting cards.

Stanford Wong's *Sharp Sports Betting* explains how to bet sports, primarily NFL football. It covers home field advantage, the trade-off between the money line and betting against the spread, totals, teasers, money management, betting sports on the Internet, props on season win totals, and use of the Poisson distribution to analyze other props.

Stanford Wong's *Optimal Strategy for Pai Gow Poker* shows how to get an edge at pai gow poker, and includes advice on setting every possible hand.

King Yao's *Weighing the Odds in Hold'Em Poker* discusses limit hold'em. Topics include sizing up your opponents, counting "outs," figuring pot odds, the value of position, determining when to raise, call, or fold, bluffing, semi-bluffing, slowplaying, check-rais-

ing, regular games, shorthanded games, and playing poker on the Internet.

King Yao's *Weighing the Odds in Sports Betting* discusses sports betting. Football is emphasized, but there also is coverage of basketball, baseball, and triple-crown betting on horse racing. Included are chapters on season wins, first-half betting, March Madness pools, hedging, and more.

Ordering Information

The easiest way is to use the online order form on www.BJ21.com. Or you can visit in person or write to Pi Yee Press, 4855 West Nevso Drive, Las Vegas NV 89103-3787 for prices and an order form. Or email orders@BJ21.com. Or call 702-579-7711.

WALLET-SIZE STRATEGIES

You may reproduce these for your own use.

Table 13
Strategy For 8-5 Progressives

2853	5 SF	
	4	RF
6003	5 flush	
4964	3	trips
4557	5 straight	
3942	4	ss Q-J-10-9
	3	RF
	4	two pair
	4	SF
	2	high pair
	4	flush
	4	K-Q-J-10
5640	2	low pair
5577	4	Q-J-10-9
4484	4	J-10-9-8
3246	3	ss Q-J-9
	2	ss HC-HC
5573	4	consec no HC
5531	3	ss J-10-9
3656	3	SF 1 gap 1 HC
3280	3	SF consec no
deuce		
	2	ss HC-10
	4	a c e - h i g h
straight		
	3	K-Q-J
	2	HC-HC
	1	HC
	3	SF
0		nothing

Table 33
Strategy For 6-5 Progressives

2853	5 SF	
	4	RF
6003	5 flush	
4869	3	trips
4557	5 straight	
3942	4	ss Q-J-10-9
	3	RF
	4	two pair
	4	SF
	2	high pair
	4	flush
	4	K-Q-J-10
5622	4	Q-J-10-9
5273	2	low pair
4529	4	J-10-9-8
	2	ss HC-HC
5618	4	consec no HC
5576	3	ss J-10-9
3701	3	SF 1 gap 1 HC
3325	3	SF consec no
deuce		
	2	ss HC-10
	4	a c e - h i g h
straight		
	3	K-Q-J
	2	HC-HC
	1	HC
	3	SF
0		nothing