

PLAY BLACKJACK



Nicolae Sfetcu

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Published by: Nicolae Sfetcu

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Blackjack

Blackjack, also known as **twenty-one**, is the most widely played casino banking game in the world. Blackjack is a comparing card game between a player and dealer, meaning that players compete against the dealer but not against any other players. It is played with one or more decks of 52 cards. The object of the game is to "beat the dealer", which can be done in a number of ways:

- Get 21 points on your first two cards (called a blackjack), without a dealer blackjack;
- Reach a final score higher than the dealer without exceeding 21; or
- Let the dealer draw additional cards until his hand exceeds 21.

The player or players are dealt an initial two-card hand and add together the value of their cards. Face cards (kings, queens, and jacks) are counted as ten points. A player and the dealer can count his or her own ace as 1 point or 11 points. All other cards are counted as the numeric value shown on the card. After receiving their initial two cards, players have the option of getting a "hit", or taking an additional card. In a given round, the player or the dealer wins by having a score of 21 or by having the highest score that is less than 21. Scoring higher than 21 (called "busting" or "going bust") results in a loss. A player may win by having any final score equal to or less than 21 if the dealer busts. If a player holds an ace valued as 11, the hand is called "soft", meaning that the player cannot go bust by taking an additional card; 11 plus the value of any other card can always be less than or equal to 21. Otherwise, the hand is "hard".

The dealer has to take hits until his or her cards total 17 or more points. (In some casinos, the dealer also hits on a "soft" 17—e.g., an initial ace and six.) Players win if they do not bust and have a total that is higher than the dealer's. The dealer loses if he or she busts or has a lesser hand than the player who has not busted. If the player and dealer have the same point total, this is called a "push", and the player typically does not win or lose money on that hand.

Many rule variations of blackjack exist. Since the 1960s, blackjack has been a high-profile target of advantage players, particularly card counters, who track the profile of cards that have been dealt and adapt their wagers and playing strategies accordingly.

Other casino games inspired by blackjack include Spanish 21 and pontoon. The recreational British card game of black jack is a shedding-type game and unrelated to the subject of this article.

History

Blackjack's precursor was *twenty-one*, a game of unknown origin. The first written reference is found in a book by the Spanish author Miguel de Cervantes, most famous for writing *Don Quixote*. Cervantes was a gambler, and the main characters of his tale *Rinconete y Cortadillo*, from *Novelas Ejemplares*, are a couple of cheats working in Seville. They are proficient at cheating at *ventiuna* (Spanish for twenty-one), and state that the object of the game is to reach 21 points without going over and that the ace values 1 or 11. The game is played with the Spanish *baraja* deck, which lacks eights, nines and tens. This short story was written between 1601 and 1602, implying that *ventiuna* was played in Castilla since the

beginning of the 17th century or earlier. Later references to this game are found in France and Spain.

When twenty-one was introduced in the United States, gambling houses offered bonus payouts to stimulate players' interest. One such bonus was a ten-to-one payout if the player's hand consisted of the ace of spades and a black jack (either the jack of clubs or the jack of spades). This hand was called a "blackjack" and the name stuck to the game, even though the ten-to-one bonus was soon withdrawn. In the modern game, a *blackjack* refers to any hand of an ace plus a ten or face card, regardless of suits or colours.

Rules of play at casinos

Blackjack example game



Initial deal

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Player action



Dealer's hand revealed



Bets settled

At a casino blackjack table, the dealer faces five to seven playing positions from behind a semicircular table. Between one and eight standard 52-card decks are shuffled together. At the beginning of each round, up to three players place their bets in the "betting box" at each position in play. The player whose bet is at the front of the betting box is deemed to have control over the position, and the dealer will consult the controlling player for playing decisions regarding the hand; the other players of that box are said to "play behind". Any player is usually allowed to control or bet in as many boxes as desired at a single table, but it is prohibited for an individual to play on more than one table at a time or to place multiple bets within a single box. In many U.S. casinos, however, players are limited to playing two or three positions at a table and often only one person is allowed to bet on each position.

The dealer deals cards from his/her left (the position on the dealer's far left is often referred to as "first base") to her far right ("third base"). Each box is dealt an initial hand of two cards visible to the people playing on it, and often to any other players. The dealer's hand receives its first card face up, and in "hole card" games immediately receives its second card face down (the hole card), which the dealer peeks at but does not reveal unless it makes the dealer's hand a blackjack. Hole card games are sometimes played on tables with a small mirror or electronic sensor that is used to peek securely at the hole card. In European casinos, "no hole card" games are prevalent; the dealer's second card is neither drawn nor consulted until the players have all played their hands.

Cards are dealt either from one or two handheld decks, from a dealer's shoe, or from a shuffling machine. Single cards are dealt to each wagered-on position clockwise from the dealer's left, followed by a single card to the dealer, followed by an additional card to each of the positions in play. The players' initial cards may be dealt face up or face down (more common in single-deck games).

The players' object is to win money by creating card totals that turn out to be higher than the dealer's hand but do not exceed 21 ("busting"/"breaking"), or alternatively by allowing

the dealer to take additional cards until he/she busts. On their turn, players must choose whether to "hit" (take a card), "stand" (end their turn), "double" (double wager, take a single card and finish), "split" (if the two cards have the same value, separate them to make two hands) or "surrender" (give up a half-bet and retire from the game). Number cards count as their natural value; the jack, queen, and king (also known as "face cards" or "pictures") count as 10; aces are valued as either 1 or 11 according to the player's choice. If the hand value exceeds 21 points, it busts, and all bets on it are immediately forfeit. After all boxes have finished playing, the dealer's hand is resolved by drawing cards until the hand busts or achieves a value of 17 or higher (a dealer total of 17 including an ace, or "soft 17", must be drawn to in some games and must stand in others). The dealer never doubles, splits, or surrenders. If the dealer busts, all remaining player hands win. If the dealer does not bust, each remaining bet wins if its hand is higher than the dealer's, and loses if it is lower. In the case of a tied score, known as "push" or "standoff", bets are normally returned without adjustment; however, a blackjack beats any hand that is not a blackjack, even one with a value of 21. An outcome of blackjack vs. blackjack results in a push. Wins are paid out at 1:1, or equal to the wager, except for winning blackjacks, which are traditionally paid at 3:2 (meaning the player receives three dollars for every two bet), or one-and-a-half times the wager. Many casinos today pay blackjacks at less than 3:2 at some tables.

Blackjack games almost always provide a side bet called insurance, which may be played when dealer's upcard is an ace. Additional side bets, such as "Dealer Match" which pays when the player's cards match the dealer's up card, are sometimes available.

Player decisions

After receiving an initial two cards, the player has up to four standard options: "hit", "stand", "double down", or "split". Each option has a corresponding hand signal. Some games give the player a fifth option, "surrender".

- **Hit:** Take another card from the dealer.

Signal: Scrape cards against table (in handheld games); tap the table with finger or wave hand toward body (in games dealt face up).

- **Stand:** Take no more cards, also known as "stand pat", "stick", or "stay".

Signal: Slide cards under chips (in handheld games); wave hand horizontally (in games dealt face up).

- **Double down:** The player is allowed to increase the initial bet by up to 100% in exchange for committing to stand after receiving exactly one more card. The additional bet is placed in the betting box next to the original bet. Some games do not permit the player to increase the bet by amounts other than 100%. Non-controlling players may double their wager or decline to do so, but they are bound by the controlling player's decision to take only one card.

Signal: Place additional chips beside the original bet outside the betting box, and point with one finger.

- **Split** (only available as the first decision of a hand): If the first two cards have the same value, the player can split them into two hands, by moving a second bet equal to the first into an area outside the betting box. The dealer separates the

two cards and draws an additional card on each, placing one bet with each hand. The player then plays out the two separate hands in turn, with some restrictions. Occasionally, in the case of ten-valued cards, some casinos allow splitting only when the cards have the identical ranks; for instance, a hand of 10-10 may be split, but not one of 10-king. However, usually all 10-value cards are treated the same. Doubling and further splitting of post-split hands may be restricted, and blackjacks after a split are counted as non-blackjack 21 when comparing against the dealer's hand. Hitting split aces is usually not allowed. Non-controlling players may follow the controlling player by putting down an additional bet or decline to do so, instead associating their existing wager with one of the two post-split hands. In that case they must choose which hand to play behind before the second cards are drawn. Some casinos do not give non-controlling players this option, and require that the wager of a player not electing to split remains with the first of the two post-split hands.

Signal: Place additional chips next to the original bet outside the betting box; point with two fingers spread into a V formation.

- **Surrender** (only available as first decision of a hand): Some games offer the option to "surrender", usually in hole-card games and directly after the dealer has checked for blackjack (but see below for variations). When the player surrenders, the house takes half the player's bet and returns the other half to the player; this terminates the player's interest in the hand. The request to surrender is made verbally, there being no standard hand signal.

Hand signals are used to assist the "eye in the sky", a person or video camera located above the table and sometimes concealed behind one-way glass. The eye in the sky usually makes a video recording of the table, which helps in resolving disputes and identifying dealer mistakes, and is also used to protect the casino against dealers who steal chips or players who cheat. The recording can further be used to identify advantage players whose activities, while legal, make them undesirable customers. In the event of a disagreement between a player's hand signals and their words, the hand signal takes precedence.

Each hand may normally "hit" as many times as desired so long as the total is not above hard 20. On reaching 21 (including soft 21), the hand is normally required to stand; busting is an irrevocable loss and the players' wagers are immediately forfeited to the house. After a bust or a stand, play proceeds to the next hand clockwise around the table. When the last hand has finished being played, the dealer reveals the hole card, and stands or draws further cards according to the rules of the game for dealer drawing. When the outcome of the dealer's hand is established, any hands with bets remaining on the table are resolved (usually in counterclockwise order): bets on losing hands are forfeited, the bet on a push is left on the table, and winners are paid out.

Insurance

If the dealer's upcard is an ace, the player is offered the option of taking "insurance" before the dealer checks the hole card.

Insurance is a side bet that the dealer has blackjack and is treated independently of the main wager. It pays 2:1 (meaning that the player receives two dollars for every dollar bet) and is available when the dealer's exposed card is an ace. The idea is that the dealer's second card has a fairly high probability (nearly one-third) to be ten-valued, giving the dealer blackjack and disappointment for the player. It is attractive (although not necessarily wise) for the player to insure against the possibility of a dealer blackjack by making a maximum "insurance" bet, in which case the "insurance proceeds" will make up for the concomitant loss on the original bet. The player may add up to half the value of their original bet to the insurance and these extra chips are placed on a portion of the table usually marked "Insurance pays 2 to 1".

Players with a blackjack may also take insurance, and in taking maximum insurance they commit themselves to winning an amount exactly equal to their main wager, regardless of the dealer's outcome. Fully insuring a blackjack against blackjack is thus referred to as "taking even money", and paid out immediately, before the dealer's hand is resolved; the players do not need to place more chips for the insurance wager.

Insurance bets are expected to lose money in the long run, because the dealer is likely to have blackjack less than one-third of the time. However the insurance outcome is strongly anti-correlated with that of the main wager, and if the player's priority is to reduce variation, it is reasonable to pay for this.

Furthermore, the insurance bet is susceptible to advantage play. It is advantageous to make an insurance bet whenever the hole card has more than a chance of one in three of being a ten. Advantage play techniques can sometimes identify such situations. In a multi-hand, face-up, single deck game, it is possible to establish whether insurance is a good bet simply by observing the other cards on the table after the deal; even if there are just 2 player hands exposed, and neither of their two initial cards is a ten, then 16 in 47 of the remaining cards are tens, which is larger than 1 in 3, so insurance is a good bet. This is an elementary example of the family of advantage play techniques known as card counting.

Bets to insure against blackjack are slightly less likely to be advantageous than insurance bets in general, since the ten in the player's blackjack makes it less likely that the dealer has blackjack too.

Rule variations and their consequences for the house edge

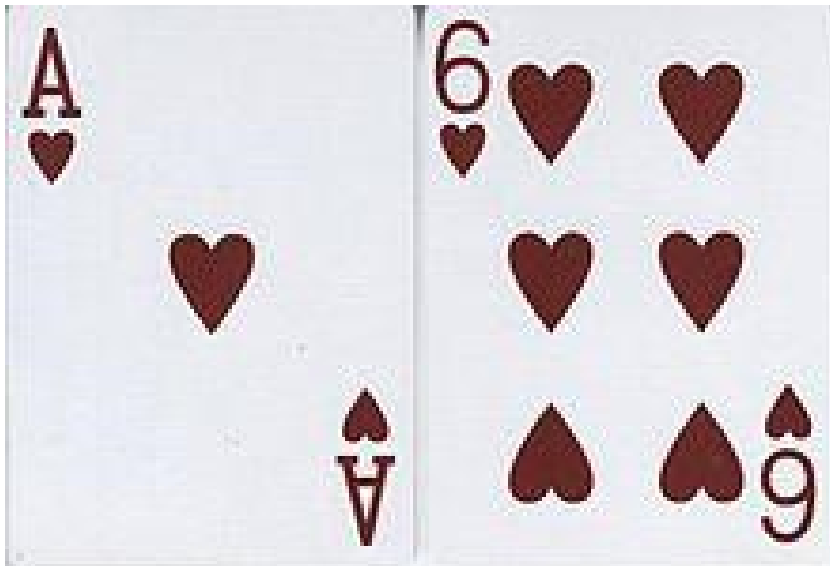
The rules of casino blackjack are generally determined by law or regulation, which establishes certain rule variations allowed at the discretion of the casino. The rules of any particular game are generally posted on or near the table, failing which there is an expectation that casino staff will provide them on request. Over 100 variations of blackjack have been documented.



Doubling down. The third card is placed at right angles to signify that the player cannot receive any more cards.

As with all casino games, blackjack incorporates a "house edge", a statistical advantage for the casino that is built into the game. The advantage of the dealer's position in blackjack relative to the player comes from the fact that if the player busts, the player loses, regardless of whether the dealer subsequently busts. Nonetheless, blackjack players using basic strategy will lose less than 1% of their total wagered amount with strictly average luck; this is very favorable to the player compared to other casino games. The loss rate of players who deviate from basic strategy through ignorance is generally expected to be greater.

- **Dealer hits soft 17**



A "soft 17" in blackjack. An ace and any combination of 6.

Each game has a rule about whether the dealer must hit or stand on soft 17, which is generally printed on the table surface. The variation where the dealer must hit soft 17 is abbreviated "H17" in blackjack literature, with "S17" used for the stand-on-soft-17 variation. Substituting an "H17" rule with an "S17" rule in a game benefits the player, decreasing the house edge by about 0.2%.

- **Number of decks**

All things being equal, using fewer decks decreases the house edge. This mainly reflects an increased likelihood of player blackjack, since if the player draws a ten on their first card, the subsequent probability of drawing an ace is higher with fewer decks. It also reflects a decreased likelihood of blackjack-blackjack push in a game with fewer decks. Casinos generally compensate by tightening other rules in games with fewer decks, in order to preserve the house edge or discourage play altogether. When offering single deck blackjack games, casinos are more likely to disallow doubling on soft hands or after splitting, to restrict resplitting, require higher minimum bets, and to pay the player less than 3:2 for a winning blackjack.

The following table illustrates the mathematical effect on the house edge of the number of decks, by considering games with various deck counts under the following ruleset: double after split allowed, resplit to four hands allowed, no hitting split aces, no surrender, double on any two cards, original bets only lost on dealer blackjack, dealer hits soft 17, and cut-card used. The increase in house edge per unit increase in the number of decks is most dramatic when comparing the single deck game to the two-deck game, and becomes progressively smaller as more decks are added.

Number of Decks / House Advantage

- Single deck / 0.17%
- Double deck / 0.46%
- Four decks / 0.60%
- Six decks / 0.64%
- Eight decks / 0.65%

Late/early surrender

Surrender, for those games that allow it, is usually not permitted against a dealer blackjack; if the dealer's first card is an ace or ten, the hole card is checked to make sure there is no blackjack before surrender is offered. This rule protocol is consequently known as "late" surrender. The alternative, "early" surrender, gives player the option to surrender *before* the dealer checks for blackjack, or in a no-hole-card game. Early surrender is much more favorable to the player than late surrender. Most medium-strength hands should be surrendered against a dealer Ace if the hole card has not been checked.

For late surrender, however, while it is tempting opt for surrender on any hand which will probably lose, the correct strategy is to only surrender on the very worst hands, because having even a one in four chance of winning the full bet is better than losing half the bet and pushing the other half, as entailed by surrendering.

Resplitting

If the cards of a post-split hand have the same value, most games allow the player to split again, or "resplit". The player places a further wager and the dealer separates the new pair dealing a further card to each as before. Some games allow unlimited resplitting, while others may limit it to a certain number of hands, such as four hands (for example, "resplit to 4").

Hit/resplit split aces

After splitting aces, the common rule is that only one card will be dealt to each ace; the player cannot split, double, or take another hit on either hand. Rule variants include allowing resplitting aces or allowing the player to hit split aces. Games allowing aces to be resplit are not uncommon, but those allowing the player to hit split aces are extremely rare. Allowing the player to hit hands resulting from split aces reduces the house edge by about 0.13%; allowing resplitting of aces reduces house edge by about 0.03%. Note that a ten-value card dealt on a split ace (or vice versa) is a "soft 21" and not a "natural".

No double after split

After a split, most games allow doubling down on the new two-card hands. Disallowing doubling after a split increases the house edge by about 0.12%.

Double on 9/10/11 or 10/11 only

Under the "Reno rule", double down is only permitted on hard totals of 9, 10, or 11 (under a similar European rule, only 10 or 11). Basic strategy would otherwise call for some doubling down with hard 9 and soft 13–18, and advanced players can identify situations where doubling on soft 19–20 and hard 8,7 and even 6 is advantageous. The Reno rule prevents the player from taking advantage of double down in these situations and thereby increases the player's expected loss. The Reno rule increases the house edge by around one in 1000, and its European version by around two in 1000.

No hole card and OBO

In most non-U.S. casinos, a 'no hole card' game is played, meaning that the dealer does not draw nor consult his or her second card until after all players have finished making decisions. With no hole card, it is almost never correct basic strategy to double or split against a dealer ten or ace, since a dealer blackjack will result in the loss of the split and double bets; the only exception is with a pair of A's against a dealer 10, where it is still correct to split. In all other cases, a stand, hit or surrender is called for. For instance, holding 11

against a dealer 10, the correct strategy is to double in a hole card game (where the player knows the dealer's second card is not an ace), but to hit in a no hole card game. The no hole card rule adds approximately 0.11% to the house edge.

The "original bets only" rule variation appearing in certain no hole card games states that if the player's hand loses to a dealer blackjack, only the mandatory initial bet ("original") is forfeited, and all optional bets, meaning doubles and splits, are pushed. "Original bets only" is also known by the acronym OBO; it has the same effect on basic strategy and house edge as reverting to a hole card game.

Altered payout for a winning blackjack

In many casinos, a blackjack pays only 6:5 or even 1:1 instead of the usual 3:2. This is usually at tables with the lowest table minimums and single-deck games. Among common rule variations in the U.S., these altered payouts for blackjack are the most damaging to the player, causing the greatest increase in house edge. Since blackjack occurs in approximately 4.8% of hands, the 1:1 game increases the house edge by 2.3%, while the 6:5 game adds 1.4% to the house edge. Video blackjack machines generally pay 1:1 payout for a blackjack. The 6:5 rule is most commonly employed on table blackjack at single deck games, where they help the house to compensate for low house edge intrinsic in using one deck only.

Dealer wins ties

The rule that bets on tied hands are lost rather than pushed is catastrophic to the player. Though rarely used in standard blackjack, it is sometimes seen in "blackjack-like" games such as in some charity casinos.

Blackjack strategy

Basic strategy

Each blackjack game has a *basic strategy*, which is playing a hand of any total value against any dealer's up-card, which loses the least money to the house in the long term.

An example of basic strategy is shown in the table below, and includes the following parameters:

- Four to eight decks
- The dealer stands on a soft 17
- A double is allowed after a split
- Only original bets are lost on dealer blackjack

Key:

S = Stand

H = Hit

Dh = Double (if not allowed, then hit)

Ds = Double (if not allowed, then stand)

SP = Split

SU = Surrender (if not allowed, then hit)

The bulk of basic strategy is common to all blackjack games, with most rule variations calling for changes in only a few situations. For example, if the above game used the hit on soft 17 rule, common in Las Vegas Strip casinos, only 5 cells of the table would need to be changed: double on 11 vs. A, surrender 15 or 17 vs. A, double on A,7 vs. 2, double on A,8 vs. 6. Also when playing basic strategy never take insurance or "even money."

Estimates of the house edge for blackjack games quoted by casinos and gaming regulators are generally based on the assumption that the players follow basic strategy and do not systematically change their bet size. Most blackjack games have a house edge of between 0.5% and 1%, placing blackjack among the cheapest casino table games. Casino promotions such as complimentary matchplay vouchers or 2:1 blackjack payouts allow the player to acquire an advantage without deviating from basic strategy.

Composition-dependent strategy

Basic strategy is based upon a player's point total and the dealer's visible card. Players may be able to improve on this decision by considering the precise composition of their hand, not just the point total. For example, players should ordinarily stand when holding 12 against a dealer 4. However, in a single deck game, players should hit if their 12 consists of a 10 and a 2. The presence of a 10 in the player's hand has two consequences:

- It makes the player's 12 a worse hand to stand on (since the only way to avoid losing is for the dealer to go bust, which is less likely if there are fewer 10s left in the shoe).

Player hand	Dealer's face-up card									
	2	3	4	5	6	7	8	9	10	A
Hard totals (excluding pairs)										
17-20	S	S	S	S	S	S	S	S	S	S
16	S	S	S	S	S	H	H	SU	SU	SU
15	S	S	S	S	S	H	H	H	SU	H
13-14	S	S	S	S	S	H	H	H	H	H
12	H	H	S	S	S	H	H	H	H	H
11	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	H
10	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	H	H
9	H	Dh	Dh	Dh	Dh	H	H	H	H	H
5-8	H	H	H	H	H	H	H	H	H	H
Soft totals										
	2	3	4	5	6	7	8	9	10	A
A,8-A,9	S	S	S	S	S	S	S	S	S	S
A,7	S	Ds	Ds	Ds	Ds	S	S	H	H	H
A,6	H	Dh	Dh	Dh	Dh	H	H	H	H	H
A,4-A,5	H	H	Dh	Dh	Dh	H	H	H	H	H
A,2-A,3	H	H	H	Dh	Dh	H	H	H	H	H
Pairs										
	2	3	4	5	6	7	8	9	10	A
A,A	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
10,10	S	S	S	S	S	S	S	S	S	S
9,9	SP	SP	SP	SP	SP	S	SP	SP	S	S
8,8	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
7,7	SP	SP	SP	SP	SP	SP	H	H	H	H
6,6	SP	SP	SP	SP	SP	H	H	H	H	H
5,5	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	H	H
4,4	H	H	H	SP	SP	H	H	H	H	H
2,2-3,3	SP	SP	SP	SP	SP	SP	H	H	H	H

- It makes hitting safer, since the only way of going bust is to draw a 10, and this is less likely with a 10 already in the hand.

However, even when basic and composition-dependent strategy lead to different actions, the difference in expected reward is small, and it becomes even smaller with more decks. Using a composition-dependent strategy rather than basic strategy in a single deck game reduces the house edge by 4 in 10,000, which falls to 3 in 100,000 for a six-deck game.

Advantage play

Blackjack has been a high-profile target for advantage players since the 1960s. Advantage play is the attempt to win more using "honest" skills such as memory, computation, and observation. These techniques, while generally legal, can be powerful enough to give the player a long-term edge in the game, making them an undesirable customer for the casino and leading to ejection or blacklisting if they are detected. The main techniques of advantage play in blackjack are as follows:

Card counting

During the course of a blackjack shoe, the dealer progressively exposes cards which are dealt to his or her own and the players' hands. Careful accounting of the exposed cards allows a player to make inferences about the cards which remain to be dealt, and use these inferences in one of two ways:

- The players can make larger bets when they have the advantage. For example, the players can increase the starting bet if there are many aces and tens left in the deck, in the hope of hitting a blackjack
- The players can deviate from basic strategy according to the composition of their undealt cards. For example, with many tens left in the deck, the players may double down in more situations since there is a better chance of getting a good hand.

A typical card counting system assigns a point score to each rank of card (e.g., 1 point for 2–6, 0 points for 7–9 and 1 point for 10–A). Whenever a card is exposed, a counter adds the score of that card to a running total, the 'count'; the count is used to make betting and playing decisions according to a table which they have learned. The count starts at 0 for a freshly shuffled deck for "balanced" counting systems. Unbalanced counts are often started at a value which depends on the number of decks used in the game.

In comparison to the house edge of 0.5–1% that can be achieved by playing basic strategy in most blackjack games, card counting can give the player an advantage of up to 2% over the house.

Card counting is most rewarding near the end of a complete shoe when as few as possible cards remain. Single-deck games are therefore particularly susceptible to card counting. As a result, casinos are more likely to insist that players do not reveal their cards to one another in single-deck games. In games with more decks of cards, casinos limit penetration by ending the shoe and initiating a reshuffle when one or more decks remain undealt, or by using a shuffling machine to reintroduce the exhausted cards every time a deck has been played.

Card counting mentally is legal and is not considered cheating. However, it usually needs to be done discreetly; if a player is detected while counting, the casino may inform them that they are no longer welcome to play blackjack there, or they may be completely banned from the property.

The use of any external devices to assist with counting cards is illegal in all US states that license blackjack card games.

Shuffle tracking

Techniques other than card counting can swing the advantage of casino blackjack toward the player. All such techniques are based on the value of the cards to the player and the casino, as originally conceived by Edward O. Thorp. One technique, mainly applicable in multi-deck games, involves tracking groups of cards (also known as slugs, clumps, or packs) during the play of the shoe, following them through the shuffle, and then playing and betting accordingly when those cards come into play from the new shoe. Shuffle tracking requires excellent eyesight and powers of visual estimation, but is more difficult to detect since the player's actions are largely unrelated to the composition of the cards in the shoe.

Arnold Snyder's articles in *Blackjack Forum* magazine brought shuffle tracking to the general public. His book, *The Shuffle Tracker's Cookbook*, mathematically analyzed the player edge available from shuffle tracking based on the actual size of the tracked slug. Jerry L. Patterson also developed and published a shuffle-tracking method for tracking favorable clumps of cards and cutting them into play and tracking unfavorable clumps of cards and cutting them out of play.

Identifying concealed cards

The player can also gain an advantage by identifying cards from distinctive wear markings on their backs, or by *hole carding* (observing during the dealing process the front of a card dealt face down). These methods are generally legal although their status in particular jurisdictions may vary.

Side bets

Many blackjack tables offer a side bet on various outcomes including:

- Player hand and dealer's up card sum to 19, 20, or 21 ("Lucky Lucky")
- Player initial hand is a pair ("Perfect pairs")
- Player initial hand is suited, suited and connected, or a suited K-Q ("Royal match")
- Player initial hand plus dealer's card makes a flush, straight, or three-of-a-kind poker hand ("21+3")
- Player initial hand totals 20 ("Lucky Ladies")
- Dealer upcard is in between the value of the players two cards ("In Bet")
- First card drawn to the dealer will result in a dealer bust ("Bust It!")

- One or both of the players cards is the same as the dealers card ("Match the Dealer")
- Player allowed to make optional second hand, and effectively receive the hand of 10,8, or 18 without drawings cards ("Instant 18")

The side wager is typically placed in a designated area next to the box for the main wager. A player wishing to wager on a side bet is usually required to place a wager on blackjack. Some games require that the blackjack wager should equal or exceed any side bet wager. A non-controlling player of a blackjack hand is usually permitted to place a side bet regardless of whether the controlling player does so.

The house edge for side games is generally higher than for the blackjack game itself. Nonetheless side games can be susceptible to card counting, often requiring bespoke counting systems. Most side games do not offer sufficient win rate to justify the effort of advantage play; exceptions are "Lucky ladies" and "Over/Under".

In team play it is common for team members to be dedicated toward counting only a sidebet using a specialized count.

Blackjack tournaments

Blackjack can be played in tournament form, where players start with equal numbers of chips and the aim is to finish among the top chip-holders. Depending on the number of competitors, tournaments may be held over several rounds, with one or two players qualifying from each table after a set number of deals to meet the qualifiers from the other tables in the next round. Alternatively the Elimination Blackjack format drops the lowest-stacked player from the table at pre-determined points in the tournament, for instance after every four deals. Good strategy for blackjack tournaments can be very different from non-tournament strategy, and has the added dimension of choosing the amount to be wagered. As in poker tournaments, players pay the casino an initial entry fee to participate in a tournament, and re-buys are sometimes permitted.

Video blackjack

Some casinos, as well as general betting outlets, provide blackjack among a selection of casino-style games at electronic consoles. Video blackjack game rules are generally more favorable to the house; e.g., paying out only even money for winning blackjacks. Video and online blackjack games deal each coup from a fresh shoe, rendering card counting much less effective.

Variants of the game

Blackjack is a member of a large family of traditional card games played recreationally all around the world. Most of these games have not been adapted for casino play. Furthermore, the casino game development industry is very active in producing blackjack variants, most of which are ultimately not adopted for widespread use in casinos. The following are the prominent twenty-one themed comparing card games which have been

adapted or invented for use in casinos and have become established in the gambling industry.

- **Spanish 21** provides players with many liberal blackjack rules, such as doubling down any number of cards (with the option to *rescue*, or surrender only one wager to the house), payout bonuses for five or more card 21s, 6-7-8 21s, 7-7-7 21s, late surrender, and player blackjacks always winning and player 21s always winning, at the cost of having no 10 cards in the deck (though there are jacks, queens, and kings). An unlicensed version of Spanish 21 played without a hole card is found in Australian casinos under the name "Pontoon" (presumably borrowed from the British recreational blackjack-like game "Pontoon" which has substantially different rules).
- **21st-Century Blackjack** (also known as "Vegas Style" Blackjack) is found in California card rooms. In this form of the game, a player bust does not always result in an automatic loss; depending on the casino, the player can still push if the dealer busts as well, although the dealer typically has to bust with a higher total.
- **Double Exposure Blackjack** deals the first two cards of the dealer hand face up. Blackjacks pay even money, and players lose on ties.
- **Double Attack Blackjack** has very liberal blackjack rules and the option of increasing one's wager after seeing the dealer's up card. This game is dealt from a Spanish shoe, and blackjacks only pay even money.
- **Blackjack Switch** is played over two hands whose second cards the player is allowed to interchange. For example, if the player is dealt 10-6 and 5-10, then the player can switch two cards to make hands of 10-10 and 6-5. Natural blackjacks are paid 1:1 instead of the standard 3:2, and a dealer 22 is a push.
- **Multiple Action Blackjack** involves a player placing between 2 or 3 bets on a single hand. The dealer then gets a hand for each bet the player places on a hand. This essentially doubles the number of hands a single dealer can play per hour. Splitting and doubling are still allowed, but often limited due to limited space on the felt for additional chips. Strategy for this game is the same as strategy for conventional blackjack regardless of how many places are bet.
- **Super Fun 21** allows a player to split a hand up to four times. If the player has six cards totaling 20, he automatically wins. Wins are paid 1:1.

Examples of the many local traditional and recreational blackjack-like games include **French/German Blackjack**, called *Vingt-et-un* (French: Twenty-one) or "Siebzehn und Vier" (German: Seventeen and Four). The French/German game does not allow splitting. An ace can only count as eleven, but two aces count as a blackjack. It is mostly played in private circles and barracks. A British variation is called "Pontoon", the name being probably a corruption of "Vingt-et-un".

Blackjack Hall of Fame

In 2002, professional gamblers around the world were invited to nominate great blackjack players for admission into the Blackjack Hall of Fame. Seven members were

inducted in 2002, with new people inducted every year after. The Hall of Fame is at the Barona Casino in San Diego. Members include Edward O. Thorp, author of the 1960s book *Beat the Dealer* which proved that the game could be beaten with a combination of basic strategy and card counting; Ken Uston, who popularized the concept of team play; Arnold Snyder, author and editor of the *Blackjack Forum* trade journal; Stanford Wong, author and popularizer of the "Wonging" technique of only playing at a positive count, and several others.

Blackjack Switch

Blackjack Switch is a casino gambling game invented by Geoff Hall and patented in 2009. It is based on blackjack, but differs in that two hands, rather than one, are dealt to each playing position, and the player is initially allowed to exchange ("switch") the top two cards between hands. Natural blackjacks are paid 1:1 instead of the standard 3:2, and a dealer hard 22 pushes all player hands except a natural.

History

Blackjack Switch was conceived after Hall - who was a card counter at the time - became frustrated at being dealt 2 weak hands when playing Blackjack that could be improved dramatically if the top two cards were allowed to be switched. Hall then developed this idea and exhibited the game at the G2E conference in Las Vegas in October 2000. Blackjack Switch was installed in Harvey's Casino in Iowa in February 2001. After this Hall modified the game to include the 'Push on 22' rule in 2003. This modification led to the game being installed in Four Queens in December 2003. The game has since become widely available in offline casinos in Las Vegas and around the world and is offered only by Playtech casinos.

Play

Blackjack Switch is played with four, six or eight Anglo-French-American 52-card decks which are shuffled together. The shuffled cards are dealt from a dealing shoe or a shuffling machine.

A semicircular card table with a similar layout to blackjack is used. Each playing position has two betting boxes, rather than one, and the initial wagers these two boxes must be identical. However, each corresponds to a separate hand; during play they may be doubled and split independently, and are resolved separately.

In the initial deal, the dealer puts one card face up on each box of each playing position starting from his left, deals a face-up card to himself, and then a further card to each box left to right. After resolving any side bet, the dealer then consults each player in turn, initially asking them whether they wish to "switch" their top cards. For example, if the player is dealt 10-5 and 6-10, then the player may switch to transform the two hands into 10-10 and 6-5. After a player has made a decision whether or not to switch, the dealer offers him the chance to hit, stand or double, firstly for the hand on the player's right-hand box, then for the one on the left. As in blackjack, a player hand which exceeds 21 is "bust"; its cards are removed and its backing wager acquired by the house.

When all players have been consulted, the dealer plays out his hand according to blackjack-style drawing rules, with the difference that a dealer hand of 22 is not a bust but a push (a tie) against any surviving player hand; the only exception is a player blackjack which has not been obtained by switching or splitting.

The small variations in dealer drawing rules between casinos which are found in blackjack are also found in Blackjack Switch, such as whether the dealer must stand or hit on

soft 17 (a hand totalling 7 but containing an ace), whether even money/insurance is offered, whether a player may double after a split, and whether a player may hit split aces.

Strategy

The strategy of Blackjack Switch covers both the switch decision and the subsequent decisions of whether to stand, double, or draw a further card which are familiar from blackjack strategy.

The switch decision

The correct decision regarding whether to switch is sometimes obvious, particularly when there is the largest difference in advantage. However, borderline and counter-intuitive cases are relatively common, and switching strategy is hard to summarize. While an often-quoted rule of thumb is to choose the option that forms or preserves the best single hand, this is unreliable; sometimes it is even correct to break up a natural by switching, for instance in the case AT + T[3-8] vs. dealer 7, 8 or 9. The correct switching choice depends on the dealer card in a significant minority of cases. Near-optimal schemes which can be learnt have been developed by several authors: Arnold Snyder presents a protocol for switching decisions based on four categories of hand, "winner", "push", "loser" and "chance" which he claims reduces the house edge to 0.25% under his ruleset. Cindy Liu presents a scheme based on assigning a point value to the dealt hands and those produced by switching.

Basic strategy after the switch decision

- Key:
S = Stand
H = Hit
D = Double
SP = Split

Basic strategy for playing out blackjack switch hands, after the switching decision has been made,

Player's hand	Dealer's face-up card									
	2	3	4	5	6	7	8	9	10	A
Hard totals										
17-20	S	S	S	S	S	S	S	S	S	S
14-16	S	S	S	S	S	H	H	H	H	H
13	H	S	S	S	S	H	H	H	H	H
12	H	H	H	S	S	H	H	H	H	H
11	D	D	D	D	D	D	D	D	H	H
10	D	D	D	D	D	D	D	H	H	H
9	H	H	H	H	D	H	H	H	H	H
5-8	H	H	H	H	H	H	H	H	H	H
Soft totals										
	2	3	4	5	6	7	8	9	10	A
A,8, A,9	S	S	S	S	S	S	S	S	S	S
A,7	S	S	S	D	D	S	S	H	H	H
A,6	H	H	H	D	D	H	H	H	H	H
A,5	H	H	H	H	D	H	H	H	H	H
A,2-A,4	H	H	H	H	H	H	H	H	H	H
Pairs										
	2	3	4	5	6	7	8	9	10	A
A, A	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
10,10	S	S	S	S	S	S	S	S	S	S
9,9	S	S	SP	SP	SP	S	SP	SP	S	S
8,8	SP	SP	SP	SP	SP	SP	SP	SP	H	H
7,7	S	SP	SP	SP	SP	SP	H	H	H	H
6,6	H	H	SP	SP	SP	H	H	H	H	H
5,5	D	D	D	D	D	D	D	H	H	H
4,4	H	H	H	H	H	H	H	H	H	H
2,2 3,3	H	H	H	SP	SP	SP	H	H	H	H

is tabulated below, for a game in which the dealer hits soft 17 and peeks for blackjack. Compared to traditional blackjack, in Blackjack Switch there are fewer occasions where doubling or splitting is rewarding, and more occasions where it is correct to hit at the risk of going bust. The differences originate from the push-on-dealer-22 rule.

Side bet

Blackjack Switch tables typically allow a side bet, called Super Match, which rewards pairs, three-of-a-kind, two-pairs or four-of-a-kind among the four initial cards comprising the player's two hands. For a 6-deck game, the Super Match bet pays out 1 to 1 if there is a pair present, 5 to 1 for three of a kind, 8 to 1 for two pairs and 40 to 1 for four of a kind. This seems to mitigate the adverse effect on the player of the case where the two top or bottom cards are identical, which robs the player of a meaningful switching decision, although, like most side bets, playing it increases the house edge.

Chinese Blackjack

Chinese Blackjack is also known as **21-point**, or **ban-luck** (Hokkien) or **ban-nag** (Cantonese). The game is played in South East Asia which bears similarity to conventional Blackjack. In Malaysia, this variant is known as **Kampung (Village) Blackjack**, to differentiate from the standard **Casino Blackjack**, and it grew from the game played in the old days in villages.

Traditionally, most non-hardcore gamblers will play some form of gambling during the Chinese New Year as it is believed the new year brings in fresh new luck, and Chinese Blackjack is one of the most popular games to be played during the new year.

The game uses one or two 52-card deck(s) and is playable by any number of players. One of them is to be a dealer, or they may take turn to be the dealer, e.g. each person deals 3 rounds or 3 winning rounds. In this article, players beside the dealer shall be denoted "player(s)".

The game probably evolved from the fact that amongst friends, it is difficult to host a casino rules blackjack that needs a dealer which plays very differently from the players. In casino rules, the cards are opened, and the dealer must play at least until 17 points but must stand once reached, while the players have no limits. This is complicated for a home friendly game, and it appears that the odds are stacked against the dealer. So most friends don't volunteer to be the dealer.

A unique feature is that the dealer is allowed to selectively reveal some players' hands, settle bets with them and then hit again and reveal other players' hands. Another unique feature is a special status given to owning 5 cards unbusted.

Although Chinese Blackjack has some standard rules, unusual house rules are common.

Kampung Blackjack

In Malaysian **kampung blackjack**, which is likely to be a derivative of the original Chinese Blackjack, ('Kampung' means village in Malay) the following rules apply:

- All hands including the dealer must reach at least **16 points** (reached 'license' or 'passport'), or a penalty applies (usually the offender has to pay all players).
- The maximum number of cards to be drawn is 5 only.
- All hands are closed, but any player including the dealer may choose to show part of his hand to 'psycho' other players.
- A **burn** rule may apply to make things more exciting. Players receiving the initial 2 cards of 15 points may get a new lease of luck by drawing a fresh set of cards by doubling up their original bet. It gets interesting when the dealer does the burn, as all players must then double up as well. Players may choose not to 'burn' with the dealer by forfeiting the bet.
- A Blackjack is one that has 21 points achieved by a ten/picture card + an ace, and usually is paid as 1:2.
- In addition, other special winning conditions apply:
 - Any combination to 21 points (usually paid out as 1:2), drawn to a maximum of 5 cards.

- Surviving unbusted at 5 cards (usually 1:2).
- Unbusted at 5 cards AND 21 (usually 1:3).
- Double ace 21 (usually 1:3).
- Triple 7 21 (usually a big payout from 1:5 to 1:21, depending on house rules).
- Unlike Chinese Blackjack described below, pairs has no winning privileges.
- The dealer's turn is always last. He may choose selectively open the hands of the players, and make an immediate payout/collect according to the points he has at hand. After that, he may continue to hit himself to chance if he can get higher points, or bust. This feature gives a perception of 'another lifeline' as the dealer with a bad card like 16 or 17 points can eliminate players with 3 or 4 cards on the likelihood that they have busted, before attempting another attempt to beat players with 2 cards which are likely to be good cards (18 to 21).

Apart from the above, the game is similar to the Chinese Blackjack describe below.

Dealing

Players place their bets. The dealer shuffles the cards thoroughly and to prevent dealer cheating, one player may "cut the hand" by which a player take a number of cards off from the shuffled deck before dealing begins. The dealer may deal the cards clock or anti-clockwise, and may choose to deal himself first or last. All cards face down. He deals two cards per person and put back the extra cards to the "cut hand".

Point counting rules

- K, Q, J = 10
- 10, 9, 8, 7, 6, 5, 4, 3, 2 = respective face value
- If your total number of cards is 2, then Ace = 11 or 10
- If your total number of cards is 3, then Ace = 10 or 1
- If your total number of cards is 4 and above, then Ace = 1

Checking for Blackjack

Each player including the dealer checks his hand for the following special combinations

- Ace + Ace = ban-ban
- Ace + (10/J/Q/K) = ban-luck
- 15 points = free hand
- Pairs
- 7-7-7

Ban-Ban

If a player receives a ban-ban, he is deemed to have won his bet tripled from the dealer immediately, unless the dealer receives a ban-ban (a tie) or a free hand (an escape).

If the dealer receives a ban-ban, he is deemed to have won all player bets tripled immediately, unless the player receives a ban-ban (a tie) or a free hand (an escape).

Ban-Luck

If a player receives a ban-luck, he wins his bet doubled from the dealer immediately, unless the dealer has a ban-ban (player loses), or a ban-luck (a tie), or a free hand (an escape).

If the dealer receives a ban-luck, he wins all player bets doubled immediately, unless the player has a ban-ban (dealer loses), or a ban-luck too (a tie), or a free hand (an escape).

15 Points (House Rule)

If the player has a free hand, he may decide to continue or not to continue with the game.

If the dealer has a free hand, he may decide to continue or not to continue with the game. If he chooses not to, then the cards shall be collected back, reshuffled and dealt again.

Pairs (House Rule)

If player receives a pair, player wins his bet doubled.

7-7-7 (House Rule)

If player hits on a pair of 7 and obtains 7 as the third card, player wins his bet 21 fold.

The players' turns

After checking for Blackjack, each player takes turn to make the following decisions, depending on the conditions. The player may add more than one card.

- total < 16, hit (add one card).
- total \geq 16 and < 21, hit or stand.
- total = 21, stand.
- total > 21, busts.

If the player has 5 cards on his hands, he must reveal his cards

- number of cards = 5 (**5-Dragon**), collect win from dealer immediately, double the bet.
- number of cards = 5 and total = 21, collect win from dealer immediately, triple the bet. (House Rule)
- number of cards = 5 and total > 21, lose double the bet to dealer immediately.

The dealer's turn

After all players are done, the dealer has to make the following decisions, depending on the conditions. The dealer may hit more than one card.

- total < 16, hit (add one card).
- total \geq 16 and < 21, hit or reveal some players' hands then hit.
- total = 21, reveal all players' cards.
- total > 21, dealer busts.
- number of cards = 5 (**5-*Dragon***), collect win from players immediately, double all bets.
- number of cards = 5 and total = 21, collect win from players immediately, triple all bets. (House Rule)
- number of cards = 5 and total > 21, lose to players whose hands have not been revealed yet (regardless of whether the player busts or not), double all bets.

If the dealer chooses to reveal a player's hand (only if he has at least 16 points at any time),

If the dealer has not busted

- player busts or total of dealer > total of player, dealer wins the bet (double if dealer has 21 points (House Rule))
- total of dealer = total of player, tie.
- total of dealer < total of player, player wins, (double if player has 21 points (House Rule))

If the dealer busts (with less than 5 cards on his hand), the dealer pays all players their bets (double if player has 21 points (House Rule)) unless the player also busts.

After the dealer has settled with all players, the cards are collected back and a new round begins.

Double Attack Blackjack

Double Attack Blackjack is dealt primarily in Atlantic City casinos. The game is a variation of Spanish 21 that pays even money on a blackjack and gives the player the opportunity to double their initial wager after seeing the dealer's upcard. The game also offers a bonus side bet (called Bust It!, Bust out or Buster) on whether or not the dealer will bust on the third card. This side bet must be made before the dealer's upcard is dealt, and pays out based on the rank of the card dealt. The bet only pays off if the dealer busts on the third card, and the payoffs are as follows:

- Third card is a ten. Pays off 3 to 1.
- Third card is a nine. Pays off 6 to 1.
- Third card is an eight. Pays off 8 to 1.
- Third card is a seven. Pays off 10 to 1.
- Third card is a six. Pays off 15 to 1.

There is an additional payoff if the dealer has an eight in the hand and gets another eight of the same color or suit and busts. Those payoffs are as follows:

- The eight is the same color. Pays off 50 to 1.
- The eight is the same suit. Pays off 200 to 1.

Moreover the Bust it! side bet may pay off according to the number of cards the dealer busts with. The payouts will be as follows:

- Dealer busts with 3-4 cards. Pays off 2 to 1.
- Dealer busts with 5 cards. Pays off 4 to 1.
- Dealer busts with 6 cards. Pays off 12 to 1.
- Dealer busts with 7 cards. Pays off 50 to 1.
- Dealer busts with 8 cards. Pays off 250 to 1.

Double Attack Blackjack has some specific rules:

- 8 Spanish 48-cards decks are used
- Dealer stands on a soft 17
- If a player takes insurance, a dealer peeks for blackjack
- Insurance payout is 5 to 2
- A player has a right to double down after splitting
- A player can split aces once and receive one more card
- All cards except aces can be re-split 4 times
- No re-doubling for this type of blackjack
- A player can double or surrender any time during a game

Double Exposure Blackjack

Double Exposure Blackjack (also known as *Zweikartenspiel* German: "*Two card game*") is a variant of the casino game blackjack in which the dealer receives two cards face-up in part of the initial deal. Knowing the dealer's hand provides significant information to the player. To maintain the house edge, the payout when the player receives a natural blackjack is reduced to even money from 3:2, and players lose their bets when their hand is tied with the dealer.

Other rules changes also exist to the detriment of players. Certain tables restrict doubling down and splitting, and do not allow doubles after splits.

The game was invented by Richard A. Epstein, and first appeared at Vegas World.

The basic strategy for this game is different, both because the player can see dealer cards 11 to 20 and because the player loses all ties except blackjacks. For examples, two ten-value cards are split whenever the dealer has 13 through 16, and a hard 19 must be hit if the dealer has a 20.

Pontoon



Pontoon, a hand consisting of an Ace and a card worth 10 points

Pontoon is an unlicensed variant of the American game Spanish 21 that is played in Australian, Malaysian, British, and Singaporean casinos. In Treasury Casino, Brisbane, it is known as Treasury 21. In Jupiters Casino, Gold Coast, it is known as Jupiters 21, in the Reef Casino, Cairns, it is known as Paradise Pontoon, and in Tasmania, it is known as Federal Pontoon.

It should not be confused with the British blackjack variant, which is also called Pontoon, found in the UK and Commonwealth, and played with regular 52-card decks. British pontoon uses the terms "twist" (hit), "stick" (stand) and "buy" (double the bet, not to be confused with doubling down) and a different set of rules. The rules for buying in Pontoon include allowing the player to buy on any hand of 2 to 4 cards, allowing the player to twist after he buys. Pontoon has proven to be far more popular in Australia than Spanish 21 has been in the United States.

History

Pontoon is the British or domestic version of Blackjack, which in turn is the American version of *Vingt-et-un* (French for Twenty-one), a French gambling game popular at the court of Louis XV and later, much favoured by Napoleon, especially at St. Helena. In the twentieth century it became the most popular game of the armed forces of English-speaking nations. Pontoon, unlike casino Blackjack, has no official rules and varies widely from school to school.

Object

Pontoon is an arithmetical game played on a table with the same layout as blackjack. In each deal, the player's aim is to receive cards totalling more in face value than the banker's, but not exceeding 21, otherwise he is "bust" and loses. A 21 consisting of an Ace and a card worth 10 is a pontoon, and pays extra. A player's 21 or pontoon always beats a dealer 21 or pontoon. Like Spanish 21, it is played from either a shoe or a 4-deck continuous shuffling machine (CSM). The shoe games use six or eight Spanish decks, which are regular 52-card decks, minus the ten-spot cards. Cards Two to Nine count 2 to 9 respectively, courts 10 each, Aces 1 or 11, depending on what is better for the hand.

Rules

Pontoon has similar rules to Spanish 21, with some notable differences, listed below.

1. Just like in Australian, Asian, and European blackjack, the dealer has no hole card (NHC). This means that the players do not know whether or not the dealer has a natural (a.k.a. Blackjack, an Ace and a 10-valued card) until the end of the round, when the dealer draws his second card. Therefore, it is possible to draw to "21" and win against a dealer natural, which is player advantageous and not possible in either Spanish 21 or Blackjack.
2. Because the dealer has no hole card, it is possible to double and/or split and lose multiple bets to a dealer natural. All casinos, except for Adelaide Casino, offer either BB+1 or OBBO to compensate.
3. An Ace in a pre-double hand is always counted as 1, rather than 1 or 11. For example, if the player doubles on soft 18 (an Ace plus one or more cards totaling 7), he/she is essentially doubling on 8. This rule makes doubling on soft hands highly inadvisable.
4. Players are not allowed to draw on split Aces (NDSA), which means that if the player splits Aces, he/she is given one card only on each Ace.
5. Compared with Spanish 21, which allows splitting to four hands (SPL3), there are limitations on how many hands players are allowed to split to. Casinos in Queensland and New South Wales do not permit resplitting (SPL1). In most venues, players cannot resplit Aces (SPA1), apart from Burswood Casino, Perth, and Casino de Genting, Malaysia, where it is allowed to resplit once (SPL2).

6. Players can only surrender against a dealer Ace or face (a.k.a. Picture) card. If the dealer ends up with a natural, the player will still lose the entire bet; moreover, he/she missed out on the opportunity to draw to "21" and win unconditionally. This is why surrendering is a less valuable play in Pontoon than in Spanish 21.
7. In Adelaide Casino, and Casino de Genting, Malaysia, it is allowed to double only on two-card hands. Elsewhere, players can double on any number of cards, which is called "not last chance" (NLC) doubling.
8. The dealer always hits on soft 17, abbreviated as H17.
9. Pontoon has the same super bonus payouts as Spanish 21, with the exception of Casino de Genting, Malaysia, which has a super bonus payout of RM1,000 on bets of RM10 to RM99, and RM5,000 on bets of RM100 or above.

Despite the player disadvantage of rules 2–9, on average, the house edges for Pontoon are lower than for Spanish 21, because rule 1 is so profoundly player advantageous. The rule differences mean that there are several significant strategy differences between Spanish 21 and Pontoon.

OBBO and BB+1

- BB+1 (Busted Bets plus one): After removing from the table all busted bets, all winnings and original bets from hands totaling "21", and all original bets from forfeited hands, the player loses just one bet, even if he has multiple split hands in the one box.
- OBBO (Original Bets and Busted Only): After removing from the table all busted bets, all winnings and original bets from hands totaling "21", and all original bets from forfeited hands, the player loses just one bet from each split hand remaining. If he has not split, he loses just one bet.

In summary, BB+1 is a loss of one bet per box, and OBBO is a loss of one bet per hand, given that busted bets, winnings, and original bets from forfeits and winning hands have been removed from the table. BB+1 is the more common of the two rules; the only casinos that have OBBO are Burswood Casino in Perth, and Casino de Genting, Malaysia.

Basic strategy for Pontoon

Because Pontoon has an element of player choice, players can reduce the casino advantage to less than 0.5% (with the exception of Adelaide, with house edge 0.62%), by playing optimally. The complete set of optimal plays is known as *basic strategy*, and is highly dependent on the rules. The computer-generated Pontoon basic strategy and house edge tables below are reproduced from *The Pro's Guide to Spanish 21 and Australian Pontoon*, with permission of the author, Katarina Walker. Pontoon strategy is far more difficult than Blackjack, however, casinos do not generally object to people using strategy charts at the table.

Pontoon strategy is very similar to Spanish 21 strategy, however, there are some crucial differences, mainly due to the no-hole-card rule, and the limitations on soft doubling.

Pontoon does, on average, have a lower house edge than its American counterparts because of the no-hole-card rule, which means that you are paid out immediately for your winnings on any total of 21, regardless of whether the dealer ends up with a natural (a Blackjack). It is too late for the dealer—he has already paid you out. In the US, a dealer Blackjack terminates the game, forgoing the opportunity for you to draw to 21 and win. You lose all your bets unless you also have a natural, in which you get paid 3 to 2.

Moreover, the VIP rooms in Australian casinos offer far better Pontoon table conditions than the Spanish 21 games in American casinos. Pontoon in Australia was comparable in popularity to Blackjack, so there are more Pontoon tables available in Australian casinos than Spanish 21 tables in American casinos. Unfortunately, in response to the release of the book "The Pro's Guide To Spanish 21 and Australian Pontoon" by Katarina Walker, Burswood Casino in Perth has withdrawn the game from the main floor and Crown Casino, Melbourne, have withdrawn the game from their VIP Mahogany Room and introduced continuous shuffling machines to some of the Pontoon games in the main hall. Any hand-shuffled or automatically shuffled Pontoon games at Crown Casino have penetrations below 75%, rendering the game far less profitable than in the past. There are still opportunities to get high win rates in the Endeavour VIP Room in Star City, Sydney, and the main floor at the Hobart casino. Lasseter's Alice Springs and Country Club Casino in Launceston offer the game on the weekends, but the table limits are very low, ranging from \$5 to \$200 or \$250 per box. Adelaide offers Pontoon in the main hall, but the Adelaide rules give the highest house edge of any Pontoon game in Australia at over 0.5%. Nevertheless, it is still lower than the Blackjack house edge, which exceeds 0.7%, offered on the main floor of the Adelaide casino. A Blackjack game, hand-shuffled, with slightly more player-advantageous rules in offered in the Adelaide VIP room, with table limits conducive to serious betting. Cairns offers a six-deck Pontoon game with a competitive house edge on the main floor but it gets crowded and has a \$400 or \$500 table limit, so it does not reap a profitable game. At the end of the day, the best Pontoon house edge in the world is of no use if the table limit is too small for your bankroll, and the table is crowded, especially with slow players. If playing solitary on the table by gives a pro player almost 200 hands an hour, you will be earning five times as much per hour as on a packed table, where you can expect no more than 40 hands an hour, more if you can nab more than one box.

Darwin casino in the Northern territory does not offer Pontoon at all, and Jupiter's on the Gold Coast only offers Pontoon with continuous shuffling machines, which is a pointless activity. Treasury Casino, Brisbane, offers a 6-deck hand-shuffled or automatically shuffled Pontoon game in the VIP room, but the penetration can get as low as 67%, the heat is high, and camouflage is a must, which is costly to your win rate. The comps at Brisbane are not particularly competitive either. It is owned by Tabcorp who "sweat the money", as the saying goes. They do not take the risks that the Packer-owned Crown and Burswood Casinos are willing to take, risks that pay off to the casino shareholders, as well as the highly skilled pro player, providing the casino has the cash reserves to cover freak windfalls. Canberra used to offer the best Pontoon game in the country, a 4-deck game with a tiny house edge of less than 0.3% and great penetration, but they took away their \$25 table, then added continuous shuffling machines to their \$10 Pontoon table, so Canberra is no longer the Pontoon mecca of Australia, and is not worth a visit by the discerning professional card counter.

The above is a basic strategy table for all Pontoon rule variations, with a few exceptions: if no OBBO/BB+1, hit 11 vs X and A; if no OBBO/BB+1 and no Ace re-splits, hit A-A vs X; if last chance doubling, split 4-4 vs 6.

Key:

H = Hit

P = Split

F = Forfeit after doubling

S = Stand (or play on after doubling)

S4 = Stand, but hit if 4 or more cards

S5 = Stand, but hit if 5 or more cards

S6 = Stand, but hit if 6 or more cards

. = Hit if 6-7-8 possible

: = Hit if suited 6-7-8 or 7-7-7 possible

; = Hit if spaded 6-7-8 possible

D = Double

D3 = Double, but hit if 3 or more cards

D4 = Double, but hit if 4 or more cards

D5 = Double, but hit if 5 or more cards

House Edge

The following table lists the Pontoon house edges for all known rule sets. The house edge is equivalent to the house advantage over a player who is following the basic strategy tabulated above. (The figures were obtained from 10-billion hand simulations and have a standard error of 0.001%. The super bonus is averaged out to a 100:1 payout.) (SPL3 = can split three times to form four hands, SPL2 = can split twice to form three hands, SPL1 = can split once only, SPA1 = no Ace resplits, NLC = not last chance doubling, D9 = doubling on 9-11 only)

As all Australian casino Blackjack games have house edges greater than 0.5%, Pontoon is the superior of the two games. In general, casino staff and Blackjack players erroneously believe that Pontoon has a higher house edge than Blackjack, because the removal of the ten-spot cards creates a 2% disadvantage for the player. In Pontoon, the player can draw to "21" and win against a dealer Blackjack; this combined with "not-last-chance" doubling, forfeit, player "21" always wins, player Blackjacks always get paid at 3:2, and bonuses on certain hands, actually *overcompensates* for the 2% disadvantage. The result is that Pontoon, on average, has about two-thirds the house edge of Australian Blackjack, which due to no surrender, hole card, and limitations on soft doubling, has some of the highest house edges for regular Blackjack in the world.

Your hand	Dealer's face-up card										
	2	3	4	5	6	7	8	9	X	A	
Hard totals											
18-20	S	S	S	S	S	S	S	S	S	S	
17	S	S	S	S	S	S	S	S	H	H	
16	S	S	S	S	S	H	H	H	H	H	
15	S	S	S	S	S	H	H	H	H	H	
14	H	H	S	S	S	H	H	H	H	H	
13	H	H	H	H	S	H	H	H	H	H	
12	H	H	H	H	H	H	H	H	H	H	
11	D4	D5	D5	D5	D5	D4	D4	D4	D4	D4	
10	D5	D5	D	D	D	D4	D3	H	H	H	
9	H	H	H	H	D	H	H	H	H	H	
5-8	H	H	H	H	H	H	H	H	H	H	
Soft totals											
	2	3	4	5	6	7	8	9	10	A	
A,9	S	S	S	S	S	S	S	S	S	S	
A,8	S	S	S	S	S	S	S	S	S	S	
A,7	S	S	S	S	S	S	S	H	H	H	
A,2 - A,6	H	H	H	H	H	H	H	H	H	H	
Pairs											
	2	3	4	5	6	7	8	9	10	A	
A,A	P	P	P	P	P	P	P	P	P	H	
10,10	S	S	S	S	S	S	S	S	S	S	
9,9	S	P	P	P	P	S	P	P	S	S	
8,8	P	P	P	P	P	P	P	P	P	H	
7,7	P	P	P	P	P	P	H	H	H	H	
6,6	H	H	P	P	P	H	H	H	H	H	
5,5	D	D	D	D	D	D	D	H	H	H	
4,4	H	H	H	H	H	H	H	H	H	H	
3,3	P	P	P	P	P	P	P	H	H	H	
2,2	P	P	P	P	P	P	P	H	H	H	
Forfeit strategy											
	2	3	4	5	6	7	8	9	10	A	
12-16	S	S	S	S	S	S	S	S	S	S	
17	S	S	S	S	S	S	S	S	S	S	
18-20	S	S	S	S	S	S	S	S	S	S	

Pontoon Rules	Decks	House Edge
OBBO, SPL2, NLC	8	0.34%
BB+1, SPL3, SPA1, NLC	4	0.31%
BB+1, SPL1, NLC	6	0.41%
BB+1, SPL1, NLC	8	0.38%
BB+1, SPL2, SPA1, NLC	8	0.40%
SPL2, SPA1, D9	8	0.62%
OBBO, SPL2, SPA1	8	0.50%

Variations

Federal Pontoon

Federal Pontoon is a version of the Australian casino game Pontoon played in Tasmania, Australia. Both casinos in Tasmania, Country Club Casino, Launceston, and Wrest Point Casino, Hobart, are owned by the Federal Group.

Rules specific to Federal Pontoon are:

- 8 decks, dealt from a shoe.
- Re-splitting to 3 hands is permitted, except for Aces.
- BB+1.

In Wrest Point Casino, Federal Pontoon is played in the public area only and is not available in the VIP room.

Jupiters 21

Jupiters 21 is a version of the Australian casino game Pontoon played in Jupiters Casino, Gold Coast, Queensland, Australia.

Rules specific to Jupiters 21 are:

- 4 decks dealt from a continuous shuffling machine (CSM).
- No re-splits are allowed.
- BB+1.

Jupiters 21 is played in the public area of Jupiters Casino only, and not available in the VIP room, Club Conrad. All Pontoon games played in Queensland casinos have the same rules.

Treasury 21

Treasury 21 is a version of the Australian casino game Pontoon played in Treasury Casino, Brisbane, Queensland, Australia.

Rules specific to Treasury 21 are:

- In the public area of Treasury Casino, 6 decks are dealt from a continuous shuffling machine (CSM).
- In the VIP room, 6 decks are dealt from a shoe.
- No resplits are allowed.
- BB+1.

All Pontoon games played in Queensland casinos have the same rules.

Power blackjack

Power Blackjack is a variant of the card gambling game Blackjack, modified by certain doubling and splitting rules, called "Power Double" and "Power Split," that are advantageous to the player, offset by the rule that, when the dealer makes a total of twenty two, any active player hands push rather than winning.

Basic rules

The rules for the power blackjack game are based on the standard Blackjack rules.

Rules variations

The main variations are:

- 6 decks in shoe
- **Dealer** stands on soft 17
- **Power double** – (see explanation below)
- **Power split** – (see explanation below)
- **Player's blackjack** gets paid 3:2.
- **Double down** after a Split is allowed
- **Dealer twenty two** pushes against any active player hands (depends on casino rules)
- **Surrender** when dealer has an open Ace is not allowed (depends on casino rules)
- **Insurance** when dealer has an open Ace is not allowed (depends on casino rules)

Power double

If the player's two-card total is nine, ten or eleven (in some casinos, only ten and eleven, and in some casinos soft 19 and 20 are included) and the player doubles, the player has the option of discarding the double-down card received and replacing it with top (unseen) card from the shoe. The player can not replace the second double card. This option increases the favorability of doubling opportunities. Thus, basic strategy for Power Blackjack includes more doubles than for regular blackjack. Furthermore, a player needs to learn the additional strategy of when to replace the first double-down card to take maximum advantage of this rule variation. This strategy will depend on the player's initial total, the card drawn, and the dealer's up card.

Power split

If the player is initially dealt a fifteen or sixteen (in some casinos hard only), the player can split the two cards, even if they are different values. After a power-split, all regular double-down and split actions are allowed, but power-split and power-double options are no longer allowed.

Seven twenty-seven

Seven Twenty-Seven is a vying game similar in some respects to poker, and often played as a "dealer's choice" variant at home poker games. It uses the same equipment and betting system, but the value of hands does not use traditional poker hand rankings, either high or low. Rather, only the sum of the cards is used to calculate the worth of a hand. The game is something of a cross between blackjack hands and poker bluffing.

The game play proceeds like this:

- Each player is dealt a downcard and an upcard.
- A betting round begins with the player on the dealer's left, and proceeds exactly as in poker: all players must either equal the largest bet or drop out.
- After the betting, each player may draw a card, face up, in turn from the dealer's left. If all players pass on their opportunity to draw, there is one more round of betting, followed by a poker-style showdown. Otherwise the game continues with another betting round (often beginning to the left of the player who began the previous round) and another draw, so there can be as few as two betting rounds in the game, but more often three or four.

Numbered cards are scored at face value; face cards count for one-half a point. Aces count for one and eleven, so a hand with a five and two aces scores 7 and 27 at the same time.

On showdown, the pot is split in half, with the hand(s) valued closest to 7 and the hand(s) valued closest to 27 each winning one half of the pot. If there is a tie where two players are off by the same amount, but in different directions (6 to 8), the lower hand wins. If there is an exact tie, that half-pot is split again among the tied players. Ties are common. The same player may contest for both high and low, usually because of aces. A player with a five and two aces can win the whole pot.

There are a few variations in rules that complicate things somewhat: first, the rule about ties in different directions varies; also, some players play with a declaration, while others play cards speak. Still others require players to not go over 7 or 27 to win the respective halves of the pot; in this variant, if everyone is over 7, the player closest to 27 without going over wins the whole pot. Still other players play with other pairs of target numbers (usually 20 points apart, such as 13 and 33, or 16 and 36).

Spanish 21

Spanish 21 is a blackjack variant owned by Masque Publishing Inc., a gaming publishing company based in Colorado. Unlicensed, but equivalent, versions may be called Spanish blackjack. In Australia and Malaysia, an unlicensed version of the game, with no dealer hole card and significant rule differences, is played in casinos under the name "Pontoon". It was first introduced into Nevada casinos in about 1995.

Rules

Spanish 21 is played on a blackjack table with a custom layout and uses the following rules:

- The game is played with six or eight decks dealt from a shoe, or from a continuous shuffling machine (CSM). Spanish 21 is played with 48-card Spanish decks, which are standard 52-card decks with the 4 ten-spot cards removed. All cards have the same values as in blackjack.
- The dealer gets a hole card.
- Like traditional blackjack, the dealer hits on 16 and stands on 17. In some venues, the dealer hits on a soft 17 (abbreviated as H17), though most venues have the dealer stand on soft 17 (S17). Hitting soft 17 (H17) negatively impacts the player; that rule increased the house edge by 0.40%.
- Blackjack (a natural total of 21 on the first two cards) always wins, and is always paid 3:2 regardless of whether or not the dealer has a blackjack.
- Insurance is paid 2:1, just like in blackjack, despite the fact that there are four fewer ten-valued cards per deck. As 3 cards in 12 are worth ten, the chance of the dealer getting a blackjack when showing an Ace is only 25%. Therefore, for insurance to be an even bet, it would have to pay 3:1, not 2:1. The house edge on the insurance is 24.7%, one of the worst of any wager in a casino.
- Hitting, standing, and splitting all follow similar rules to blackjack. Doubling after splitting (DAS) is always permitted, and, in most venues, players are allowed to draw as many cards as they wish after splitting aces, or may double down after receiving second or subsequent cards.
- Players can split to a maximum of four hands, even on aces.
- In most venues, if the dealer does not have blackjack, players may surrender, and get half their bet back in exchange for relinquishing the right to play on. This type of surrender is known as a "late surrender" (LS).
- Players can surrender after doubling (sometimes called forfeit, double-down rescue, or concede). The dealer takes the original bet, and the player retains the double portion of the bet. This is because the player is allowed to double down for less than the original bet.
- Once the initial two-card hands are dealt, if the dealer is showing an Ace or face card, he peeks underneath the hole card to check for a blackjack, before playing actually commences. If he has blackjack, all players automatically lose, unless they also have a blackjack (which, as mentioned above, automatically win 3:2).

- The player may double down on any total and on any number of cards.
- In some casinos, players may *double double down*, or redouble up to two times after doubling down. For example: The player bets one unit and is dealt 2-3, giving a hand total of 5; the dealer is showing a 6. The player doubles the first time and draws a 3. The hand total is now 8 and the total amount wagered is two units. The player doubles a second time and draws a 3. The hand total is now 11 and the total amount wagered is four units. When the player doubles a third time on 11, the total amount wagered will be eight units. Redoubling is a profoundly player-advantageous rule, when optimally executed.
- A total of 21 always wins for the player. It never pushes against the dealer's 21.
- A five-card 21 pays 3:2, a six-card 21 pays 2:1, and a 21 with seven or more cards pays 3:1. A 21 composed of 6-7-8 or 7-7-7 of mixed suits pays 3:2, of the same suit pays 2:1, and of spades pays 3:1. These bonus payouts apply even if the hand was the result of a split. However, doubling down negates these bonuses.
- A "super bonus" of \$1000 for bets under \$25, and \$5000 for bets of \$25 and over, is paid on a suited 7-7-7 against any dealer 7. All other players at the table receive a \$50 "envy bonus". Splitting or doubling down negates the "super bonus".

The removal of the four tens in each deck gives roughly a 2% advantage to the dealer. The liberal rules of Spanish 21, though, do compensate for this. With optimal play, the house edge of a Spanish 21 table is lower than that of a blackjack table with the same rules on hitting or standing on soft 17.

The game also offers an optional "Match the Dealer" side bet, which compares a player's cards with the dealer's upcard. Matching the rank of the dealer's card pays 4:1 on a six-deck game, and 3:1 on an eight-deck game, while a "perfect match" of rank and suit pays 9:1 on six decks and 12:1 on eight decks. A player may win on both cards; (e.g. if a player has 8s 8c and the dealer has 8c as an upcard, the player will receive 3:1 on the rank match and 12:1 on the perfect match, paying out a total of 15:1.) While this side bet has a house edge of approximately 3%, significantly higher than the edge of the main game, it is one of the lowest house edges of any blackjack side bet.

Masque Publishing, the owners of this game, maintains a list of venues that offer S17 or redoubling rules.

House edge

The following tables list the Spanish 21 house edges for all rule sets found in North America. (The figures were obtained from 10-billion hand simulations and have a standard error of 0.001%. The super bonus is averaged out to a 100:1 payout.) These charts assume that the player is using basic strategy. "H17" means that the dealer hits soft seventeen, "S17" means that the dealer stands on soft seventeen.

Rules	Decks	House Edge
H17	6	0.78%
	8	0.80%
S17	6	0.37%
	8	0.38%
H17 with redoubling	6	0.42%
	8	0.45%

Rule Changes	Change in House Edge
No surrender (H17)	0.018%
No surrender (S17)	0.006%
No draws on split Aces (H17 or S17)	0.28%
No draws on split Aces (H17 with redoubling)	0.29%
Natural after split pays 3:2	-0.16%

Match the Dealer

Match the Dealer is a side bet offered on most Spanish 21 games. The player wins the side bet if the rank of either or both of their initial two cards matches the rank of the dealer's up card. If the cards match in both rank and suit, the player wins a bigger payout. Some casinos offer a second Match the Dealer bet which wins when either or both of the player's initial two cards match the dealer's hole card. The payouts and the house edge vary depending on the number of decks in play as shown below.

Number of Decks	Non-Suited Match	Double Non-Suited Match	Suited Match	Suited + Non-Suited Match	Double Suited Match	House Edge
2	4:1	8:1	15:1	19:1	NA	3.63%
4	4:1	8:1	10:1	14:1	20:1	3.20%
5	3:1	6:1	13:1	16:1	26:1	3.53%
6	4:1	8:1	9:1	13:1	18:1	3.06%
8	3:1	6:1	12:1	15:1	24:1	2.99%

Card Counting

One of the bonuses in Spanish 21 is that the small cards are more valuable than they would be in traditional blackjack because of the bonuses for five, six, and seven card 21s. Therefore the effects these bonuses would make card counting much less effective than Blackjack.

Super Fun 21

Super Fun 21 is a variation of blackjack. The game is played using a standard 52 card deck. Aces can be counted as either a one or eleven depending on which value would best benefit the player's hand. All the face cards in the deck each count as ten. The remaining cards are taken at face value. The player must first place a bet and is then dealt two cards face up. The dealer is dealt two cards as well, but one is face up and one face down. The player then has the option to either "hit", (request another card) or "stand" (decline additional cards). The player's hand must beat the dealer's by coming closer to 21 without "busting" (exceeding 21). A winning hand with a total of 21 is called a blackjack, or natural.

The game differs from traditional blackjack because the player automatically wins if his hand has six cards or more with a total of 20. This rule applies even if the dealer has a total of 21 (blackjack). Other advantages to Super Fun 21 include being able to split a hand up to four times, a player's blackjack supersedes a dealer's blackjack, a player may "double down" at any point no matter how many cards he has been dealt, and the player automatically doubles their money with a hand consisting of five cards or more that total 21.

The other major difference between Super Fun 21 and traditional blackjack is that a blackjack only pays even money instead of the traditional 3 to 2 payout. This more than makes up for the edge the casino is giving with the liberal rules variations above.

Super Fun 21 is protected by U.S. Patent number 5,979,897 issued in 1999 to Howard F. Grossman, a well-known Las Vegas gaming consultant, and assigned to Tech Art Management, Inc.

Elimination Blackjack

Elimination Blackjack is a tournament format of blackjack invented by Russ Hamilton, and is played on the Ultimate Blackjack Tour and in various casinos. It combines the game of blackjack with elements of No Limit Texas Hold'Em. Unlike Texas Hold'Em tournaments, players are still competing against the same dealer that is why the results of most players at the table are likely to be the same. UltimateBet.com, a sponsor of the Ultimate Blackjack Tour, offers online elimination blackjack tournaments.

Rules

A round of elimination blackjack in most cases is thirty hands in length. Depending upon the organization hosting the event, a player will start with between \$10,000 and \$100,000 in chips. While certain organizations have their own house rules, elimination blackjack usually follows the following rules:

- The house must hit on soft 17 and anything below, and must stay on hard 17 and anything above.
- A player may split pairs up to four times with the exception of aces. Some rule sets also allow splitting different cards valued at 10, such as a queen and a jack.
- A shoe of six decks is used.
- A player's bet must stay within the minimum and maximum bet allowed at the table (this rule is excluded in the World Series of Blackjack). The maximum bet is usually at least several times bigger than the starting chip stack.
- A player may surrender their hand and thus recover one half of their original bet.
- A player may buy insurance if the up card for the house is an ace.
- A player can only double down with two cards.
- A maximum of seven players is allowed per table.
- A player has twenty five seconds in a normal hand to make a decision. In an elimination hand a player has forty five seconds.

Some organizations allow a secret bet where the players at the table do not know the value of that player's bet, until after that player's hand is concluded. In most games, this option can be used only once during a single round of the tournament.

Eliminations

Depending on the organization hosting the event, a player is eliminated from the tournament in three ways:

- Losing all of his chips.
- Not having enough chips to meet the minimum required bet.
- Being the player with the fewest chips after a certain number of hands are played. In this case, the usual cutoff points are hands #8, #16, and #25 (so-called "elimination hands"). A player is always eliminated from the game in an elimination hand, even if a player has been eliminated in the previous hand.

Winning

Usually the last player left at the table is the winner, or the player with the most chips after 30 hands have been played. Blackjack is sometimes played in a multi-table tournament format where one or more players advance to the next round after the others have been eliminated. If there are too many players left after 30 hands, the players who advance are determined by chip stacks.

Card counting

Card counting is a casino card game strategy used primarily in the blackjack family of casino games to determine whether the next hand is likely to give a probable advantage to the player or to the dealer. Card counters are a class of advantage players, who attempt to decrease the inherent casino house edge by keeping a running tally of all high and low valued cards seen by the player. Card counting allows players to bet more with less risk when the count gives an advantage as well as minimize losses during an unfavorable count. Card counting also provides the ability to alter playing decisions based on the composition of remaining cards.

Card counting, also referred to as card reading, often refers to obtaining a sufficient count on the number, distribution and high-card location of cards in trick-taking games such as contract bridge or spades in order to optimize the winning of tricks.

Basics

The most common variations of card counting in blackjack are based on statistical evidence that high cards (especially aces and 10s) benefit the player more than the dealer, while the low cards, (especially 4s, 5s, and 6s) help the dealer while hurting the player. A high concentration of aces and 10s in the deck increases the player's chances of hitting a natural Blackjack, which pays out 3:2 (unless the dealer also has blackjack). Also, when the shoe has a high concentration of 10s, players have a better chance of winning when doubling. Low cards benefit the dealer, since according to blackjack rules the dealer must hit *stiff hands* (12-16 total) while the player has the option to hit or stand. Thus a dealer holding (12-16) will bust every time if the next card drawn is a 10, making this card essential to track when card counting.

Contrary to the popular myth, card counters do not need unusual mental abilities in order to count cards, because they are not tracking and memorizing specific cards. Instead, card counters assign a point score to each card they see that estimates the value of that card, and then they track the sum of these values – a process called keeping a "running count." The myth that counters keep track of every card was portrayed in the movie *Rain Man*, in which the savant character Raymond Babbitt counts through six decks with ease and a casino employee erroneously comments that it is impossible to count six decks.

Systems

Basic card counting assigns a positive, negative, or zero value to each card value available. When a card of that value is dealt, the count is adjusted by that card's counting value. Low cards increase the count as they increase the percentage of high cards in the remaining shoe, while high cards decrease it for the opposite reason. For instance, the Hi-Lo system subtracts one for each dealt ten, Jack, Queen, King or Ace, and adds one for any value 2-6. Values 7-9 are assigned a value of zero and therefore do not affect the count.

The goal of a card counting system is to assign point values that roughly correlate to a card's Effect of Removal (EOR). The EOR is the actual effect of removing a given card from

play, and the resulting impact on the house advantage. The player may gauge the effect of removal for all cards dealt, and assess the current house advantage of a game based on the remaining cards. As larger ratios between point values are used to create better correlation to actual EOR with the goal of increasing the efficiency of a system, such systems use larger and larger numbers and are broken into classes such as level 1, level 2, level 3, and so on, with regards to the ratio between the highest and lowest assigned point values.

The High-Low system is considered a *single-level* or *level-one* count, because the count never increases or decreases by more than a single, predetermined value. A *multilevel* count, such as Zen Count or Wong Halves, makes finer distinctions between card values to gain greater play accuracy. Rather than all cards having a value of +1, 0, or 1, an advanced count might also include card ranks that are counted as +2 and 2, or +0.5. Advanced players might additionally maintain a *side count* (separate count) of specific cards, such as a side count Aces, to deal with situations where the best count for betting accuracy differs from the best count for playing accuracy.

Many side count techniques exist including special-purpose counts used when attacking games with nonstandard profitable-play options such as an over/under side bet.

The disadvantage of higher-level counts is that keeping track of more information can detract from the ability to play quickly and accurately. A card-counter might earn more money by playing a simple count quickly—more hands per hour played—than by playing a complex count slowly.

The following table illustrates a few ranking systems for card counting. Many others exist.

Card Strategy	2	3	4	5	6	7	8	9	10, J, Q, K	A
Hi-Lo	+1	+1	+1	+1	+1	0	0	0	-1	-1
Hi-Opt I	0	+1	+1	+1	+1	0	0	0	-1	0
Hi-Opt II	+1	+1	+2	+2	+1	+1	0	0	-2	0
KO	+1	+1	+1	+1	+1	+1	0	0	-1	-1
Omega II	+1	+1	+2	+2	+2	+1	0	-1	-2	0
Red 7	+1	+1	+1	+1	+1	+0.5	0	0	-1	-1
Zen Count	+1	+1	+2	+2	+2	+1	0	0	-2	-1

The KO Strategy was first introduced in 1992 as the "All Sevens" count in *The Book of British Blackjack*.

Design and selection of systems

The primary goal of a card counting system is to assign point values to each card that roughly correlate to the card's "effect of removal" or EOR (that is, the effect a single card has on the house advantage once removed from play), thus enabling the player to gauge the house advantage based on the composition of cards still to be dealt. Larger ratios between point values can better correlate to actual EOR, but add complexity to the system. Counting systems may be referred to as "level 1", "level 2", etc., corresponding to the number of different point values the system calls for.

The ideal system is a system that is usable by the player and offers the highest average dollar return per period of time when dealt at a fixed rate. With this in mind, systems aim to achieve a balance of efficiency in three categories:

Betting correlation (BC)

When the sum of all the permutations of the undealt cards offer a positive expectation to a player using optimum playing strategy, there is a positive expectation to a player placing a bet. A system's BC gauges how effective a system is at informing the user of this situation.

Playing efficiency (PE)

A portion of the expected profit comes from modifying playing strategy based on the known altered composition of cards. For this reason, a system's PE gauges how effectively it informs the player to modify strategy according to the actual composition of undealt cards. A system's PE is important when the effect of PE has a large impact on total gain, as in single- and double-deck games.

Insurance correlation (IC)

A portion of expected gain from counting cards comes from taking the insurance bet, which becomes profitable at high counts. An increase in IC will offer additional value to a card counting system.

The observation of the ace plays a key role in such a way that when the ace has a distinct point value, you will see an increase in betting correlation since the ace is the most valuable card in the deck. However alerting the player to the presence of additional aces in a deck decreases the efficiency of altering play decisions based on the count lowering a system's PE since the ace offers very little value when playing out a hand. If a system does not assign a point value to an ace, it will see a decrease in BC with an increase in PE; in a situation in which the change in PE will offer a greater gain than a slight loss of BC, such a system is preferable.

One way to deal with such tradeoffs is to ignore the ace to yield higher PE while keeping a side count which is used to detect addition change in EV which the player will use to detect additional betting opportunities which ordinarily would not be indicated by the primary card counting system.

It is most common to keep a side count of aces since it is the most important card in terms of achieving a balance of BC and PE. In theory a player could keep a side count of every card and achieve a near 100% PE, however methods involving additional side counts for PE become more complex at an exponential rate as you add more side counts and the ability of the human mind is quickly overtasked and unable to make the necessary computations.

Since there is the potential to create an overtaxing demand on the human mind while using a card counting system another important design consideration is the ease of use. Higher level systems, and systems with side counts will obviously become more difficult and

in an attempt to make them easier, unbalanced systems eliminate the need for a player to keep tabs on the number of cards/deck that have already entered play typically at the expense of lowering PE.

Running counts versus True counts in Balanced counting systems

The Running count is the running total of each card's assigned value. When using Balanced count (such as the Hi-Lo system), the Running count is converted into a "True count," which takes into consideration the number of decks used. With Hi-Lo, the True count is essentially the Running count divided by the number of decks that haven't yet been dealt; this can be calculated exactly or approximated with an average card count per round times the number of rounds dealt. However, many variations of True count calculation exist.

Back-counting

Back-counting, also known as "Wonging," consists of standing behind a blackjack table that other players are playing on, and counting the cards as they are dealt. Stanford Wong first proposed the idea of back-counting, and the term "Wong" comes from his name.

The player will enter or "Wong in" to the game when the count reaches a point at which the player has an advantage. The player may then raise his/her bets as their advantage increases, or lower their bets as their advantage goes down. Some back-counters prefer to flat-bet, and only bet the same amount once they have entered the game. Some players will stay at the table until the game is shuffled, or they may "Wong out" or leave when the count reaches a level at which they no longer have an advantage.

Back-counting is generally done on shoe games, of 4, 6, or 8 decks, although it can be done on pitch games of 1 or 2 decks. The reason for this is that the count is more stable in a shoe game, so a player will be less likely to sit down for one or two hands and then have to get up. In addition, many casinos do not allow "mid-shoe entry" in single or double deck games which makes Wonging impossible. Another reason is that many casinos exhibit more effort to thwart card counters on their pitch games than on their shoe games, as a counter has a smaller advantage on an average shoe game than in a pitch game.

Advantages

Back-counting is different from traditional card-counting, in that the player does not play every hand he sees. This offers several advantages. For one, the player does not play hands at which he does not have a statistical advantage. This in turn reduces variance and fluctuations, and increases the total advantage of the player. Another advantage is that the player does not have to change their bet size as much, or at all if they choose. Large variations in bet size are one way that casinos detect card counters, and this is eliminated with back-counting.

Disadvantages

There are several disadvantages to back-counting. One is that the player frequently does not stay at the table long enough to earn comps from the casino. Another disadvantage is that some players may become irritated with players who enter in the middle of a game, and superstitiously believe that this interrupts the "flow" of the cards. Lastly, a player who hops in and out of games may attract unwanted attention from casino personnel, and may be detected as a card-counter.

Group counting

While a single player can maintain their own advantage with back-counting, card counting is most often used by teams of players to maximize their advantage. In such a team, some players called "spotters" will sit at a table and play the game at the table minimum, while keeping a count (basically doing the back "counting"). When the count is significantly high, the spotter will discreetly signal another player, known as a "big player," that the count is high (the table is "hot"). The big player will then "Wong in" and wager vastly higher sums (up to the table maximum) while the count is high. When the count "cools off" or the shoe is shuffled (resetting the count), the big player will "Wong out" and look for other counters who are signaling a high count. This was the system used by the MIT Blackjack Team, whose story was in turn the inspiration for the Canadian movie *The Last Casino* which was later re-made into the Hollywood version *21*.

The main advantage of group play is that the team can count several tables while a single back-counting player can usually only track one table. This allows big players to move from table to table, maintaining the high-count advantage without being out of action very long. It also allows redundancy while the big player is seated as both the counter and big player can keep the count (as in the movie *21*, the spotter can communicate the count to the big player discreetly as he/she sits down). The disadvantages include requiring multiple spotters who can keep an accurate count, splitting the "take" among all members of the team, requiring spotters to play a table regardless of the count (using only basic strategy, these players will lose money long-term), and requiring signals, which can alert pit bosses.

A simple variation removes the loss of having spotters play; the spotters simply watch the table instead of playing and signal big players to wong in as normal. The disadvantages of this variation are reduced ability of the spotter and big player to communicate, reduced comps as the spotters aren't sitting down, and vastly increased suspicion, as blackjack is not generally considered a spectator sport in casinos except among those actually playing (unlike craps, roulette and wheels of fortune which have larger displays and so tend to attract more spectators).

Ranging bet sizes and the Kelly criterion

A mathematical principle called the Kelly criterion indicates that bet increases should be proportional to the player advantage. In practice, this means that the higher the count, the more a player should bet on each hand in order to take advantage of the player edge. Using this principle, a card counter may elect to vary his bet size in proportion to the advantage dictated by a count creating what is called a "Bet ramp" according to the principles of the

Kelly criterion. A bet ramp is a betting plan with a specific bet size tied to each true count value in such a way that the player is betting proportionally to the player advantage with aims to maintain a constant risk of ruin for every bet made. Taken to its ultimate conclusion, the Kelly criterion would demand that a player not bet anything at all when the deck doesn't offer a positive expectation; the "Wonging" strategy described above implements this.

Expected profit

Blackjack played with a perfect basic strategy typically offers a house edge of less than 0.5%, but a typical card counter who ranges bets appropriately in a game with six decks will have an advantage of approximately 1% over the casino. Advantages of up to 2.5% are possible at normal penetrations from counting 6-deck Spanish 21, for the S17 or H17 with redoubling games. This amount varies based on the counter's skill level, penetration (1 - fraction of pack cut off), and the number of betting units that the counter is able to spread from. The variance in blackjack is high, so generating a sizable profit can take hundreds of hours of play. The deck will only have a positive enough count for the player to raise bets 10%-35% of the time depending on rules, penetration and strategy.

At a table where a player makes a \$100 average bet, a 1% advantage means a player will win an average \$1 per hand. This translates into an average hourly winning of \$50 if the player is dealt 50 hands per hour.

With typical bet ranging and typical Las Vegas six-deck rules, a player whose strategy yields an average profit of \$50 per hour will likely face a standard deviation in the neighborhood of \$1,400 per hour. Therefore, it is highly advisable for counters to set aside a large dedicated bankroll; one popular rule of thumb dictates a bankroll of 100 times the maximum bet per hand.

Another aspect of the probability of card counting is that, at higher counts, the player's probability of winning a hand is only slightly changed and still below 50%. The player's edge over the house on such hands does not come from the player's probability of winning the hands. Instead it comes from the increased probability of blackjacks, increased gain and benefit from doubling, splitting and surrender, and the insurance side bet, which becomes profitable at high counts.

Many factors will affect a player's expected profit while attacking a game, such as:

- The overall efficiency of a card counting system at detecting player advantage, this affects how often the player will actually play a hand at an advantage per period of time
- The overall efficiency at creating player advantage as a whole, a system may indicate a small advantage when in fact the advantage is much larger, this reduces the overall ROI of the system while in play.
- The rules of the game.
- Penetration will almost directly affect the magnitude of player advantage that is exploitable, and the rate that hands are dealt to a player at an advantage.
- The number of players seated at a table will slow game pace, and reduce the number of hands a player will be able to play in a given time frame.

- Game speed, table with side bets will be dealt at a slower pace than tables without them which will reduce the number of hands dealt over time.
- The use of an automatic shuffle machine or in rare cases, a dealer dedicated solely to shuffling a new shoe while another is in play, will eliminate the need for the dealer to shuffle the shoe prior to dealing a new one increasing game speed.

Devices

A range of card counting devices are available but are deemed to be illegal in most U.S. casinos. In February 2009, the Nevada Gaming Control Board issued a warning that an iPhone card counting application was illegal in that state. Card counting with the mind is legal and usually more accurate than this application.

Legal status

United States

As of September 2012, card counting is legal under federal, state, and local laws in the United States as long as no external card counting device or person assists the player in counting cards. It is however frowned upon by casinos. Casinos continue to offer blackjack only because the vast majority of unskilled casual blackjack players more than make up for the small number of advantage players capable of reducing the casinos' edge. In their pursuit to catch card counters, casinos can sometimes misidentify and ban unskilled casual players whose betting style (or lack of) unknowingly mimics betting patterns of card counters.

Atlantic City casinos in the State of New Jersey are forbidden from barring card counters as a result of a New Jersey Supreme Court decision. In 1979 Ken Uston, a Blackjack Hall of Fame inductee, filed a lawsuit against an Atlantic City casino, claiming that casinos did not have the right to bar skilled players. The New Jersey Supreme Court agreed, ruling that "the state's control of Atlantic City's casinos is so complete that only the New Jersey Casino Control Commission has the power to make rules to exclude skillful players." As of 2011, New Jersey Casino Control Commission has not promulgated a regulation to the contrary. Accordingly, Atlantic City casinos are not allowed to bar card counters. In response to Uston's legal victory, Atlantic City casinos began adding decks, moving up shuffle points, and introducing other player-unfriendly rules to further decrease a skilled player's potential advantage.

Countermeasures

Casinos have spent a great amount of effort and money in trying to thwart card counters. Countermeasures used to prevent card counters from profiting at blackjack include:

- Harassment of suspected card counters by casino staff. This may be as simple as engaging a suspected card counter in a conversation to break their concentration.

- Decreasing penetration, the percentage of the cards dealt before a shuffle. This reduces the ability of a counter to take advantage of a high count that has developed.
- Assigning a high speed dealer to confuse the player or make the suspected counter more transparent to the people monitoring.
- Card-counter identification, using books of photos and facial recognition systems to "blacklist" known counters.
- Computerized scanners in blackjack tables that can identify counting systems when in use (such as MindPlay).
- Heuristic systems that keep a count and track players' bets, looking for increases/decreases matching rises and falls in the count.
- Computer systems used in surveillance rooms that surveillance staff use to target suspect players to quantify their threat to the house.
- Shuffling when a player increases their wager.
- Changing rules for splitting, doubling down, or playing multiple hands. This also includes changing a table's stakes.
- Flat betting a player or making it so they cannot change the amount they bet during a shoe.

Some jurisdictions (Nevada) have no legal restrictions placed on these countermeasures. Other jurisdictions such as New Jersey limit the countermeasures a casino can take against skilled players. In the past, casinos would sometimes resort to harsher methods (up to and including physical assault) to deter card counters – today the need to maintain good public relations and the likelihood of legal action dissuade casinos in most jurisdictions from such tactics.

Some of these countermeasures have a downside for the casino as well. Frequent shuffling, for example, reduces the amount of time that the non-counting players are playing and consequently reduces the house's winnings. Some casinos now use automatic shuffling machines to compensate for this, with some models of machines shuffling one set of cards while another is in play. Others, known as Continuous Shuffle Machines (CSMs), allow the dealer to simply return used cards to a single shoe to allow playing with no interruption. Because CSMs essentially force minimal penetration, they remove almost all possible advantage of traditional counting techniques. In most online casinos, the deck is shuffled at the start of each new round, ensuring the house always has the advantage.

A pit boss who determines that a player is a card-counter might either "back off" the player by inviting them to play any game other than blackjack, or will ban them from the casino itself. In jurisdictions where this is not legal, such as Atlantic City, a pit boss can require the player to flat-bet and disallow players from entering in the middle of a shoe. Such countermeasures effectively remove any chance of gaining an advantage from card counting in multi-deck games. The player's name and photo (from surveillance cameras) may also be shared with other casinos and added to a database of card counters and cheaters (note: card counting is not cheating, but casinos still associate the two groups together) run for the benefit of casino operators. One such blacklist was known as the Griffin Book, and was maintained by a company called Griffin Investigations. However, Griffin Investigations was forced into bankruptcy in 2005 after losing a libel lawsuit filed by professional gamblers.

Detection

Monitoring player behavior to assist with detecting the card counters falls into the hands of the on-floor casino personnel ("pit bosses") and casino-surveillance personnel, who may use video surveillance ("the eye in the sky") as well as computer analysis, to try to spot playing behavior indicative of card counting; early counter-strategies featured the dealers' learning to count the cards themselves to recognize the patterns in the players. In addition, many casinos employ the services of various agencies, such as Griffin Investigations, who claim to have a catalog of advantage players. If a player is found to be in such a database, he will almost certainly be stopped from play and asked to leave regardless of his table play. For successful card counters, therefore, skill at "cover" behavior, to hide counting and avoid "drawing heat" and possibly being barred, may be just as important as playing skill.

Detection of card counters will be confirmed after a player is first suspected of counting cards; when seeking card counters casino employees, whatever their position, could be alerted by many things that are most common when related to card counting but not common for other players. These include:

- Large buy ins
- Large bet sizes
- Dramatic bet variation especially with larger bets being placed only at the end of a shoe
- Playing only a small number of hands during a shoe
- Refusal to play rated
- Table hopping
- Playing multiple hands

The strategy applied to the playing of hands can be used to detect a possible counter since very few players play perfect playing strategy, furthermore, card counters will play perfect playing strategy, then they will suddenly alter it and make unique strategy deviations that can be a dead giveaway. Plays such as splitting tens, doubling soft 18/19/20, standing on 15/16, and surrendering on 13/14 when basic strategy says otherwise, may be a sign of a card counter.

Extremely aggressive plays such as splitting tens and doubling soft 19 and 20 are often called out to the pit to notify them because they are telltale signs of not only card counters but hole carding, and most forms of advantage gambling.

Technology for detecting card counters

Several automated systems have been designed to aid detection of card counters. The MindPlay system scans card values for the entire deck after shuffling just prior to play. The Shuffle Master Intelligent Shoe system scans card values individually as cards exit the shoe. Software called Bloodhound and Protec 21 allows voice input of card and bet values, which is used to determine the player edge. A more recent innovation is the use of RFID signatures embedded within the casino chips so that the table can automatically track bet amounts.

Automated card-reading technology has known abuse potential in that it can be used to simplify the practice of *preferential shuffling* — having the dealer reshuffle the cards

whenever the odds favor the players. To avoid liability concerns, some blackjack protection systems have been designed to refrain from sending data over the network until the shoe has ended. Other vendors consider real-time notification to surveillance that a shoe is "hot" to be an important product feature.

With card values, play decisions, and bet decisions conveniently accessible, the casino can analyze bet variation, play accuracy, and play variation.

Bet variation. The simplest way a card counter makes money is to bet more when he has an edge. While playing back the tapes of a recent session of play, software can generate a scatter plot of the amount bet versus the count at the time the bet was made and find the trendline that best fits the scattered points. If the player is not counting cards, there will be no trend; his bet variation and the count variation will not consistently correlate. If the player is counting and varying bets according to the count, there will be a trend whose slope reflects the player's average edge from this technique.

Play accuracy. Normal players tend to make basic strategy errors. Card counters must accurately know exactly when to hit, stand, split, or double down. Software can verify the rate at which the player makes errors and calculate the resulting house edge.

Play variation. When card counters vary from basic strategy, they do so in response to the count, to gain an additional edge. Software can verify whether there is a pattern to play variation. Of particular interest is whether the player sometimes (when the count is positive) takes insurance and stands on 16 versus a dealer 10, but plays differently when the count is negative.

History

American mathematician Dr. Edward O. Thorp is considered the father of card counting. His 1962 book, *Beat the Dealer*, outlined various betting and playing strategies for optimal blackjack play. Although mathematically sound, some of the techniques described no longer apply, as casinos took counter-measures (such as no longer dealing to the last card). Also, the counting system described (10-count) is harder to use and less profitable than the point-count systems that have been developed since. A history of how counting developed can be seen in David Layton's documentary film, *The Hot Shoe*.

Even before the publication of *Beat the Dealer*, however, a small number of professional card counters were beating blackjack games in Las Vegas and casinos elsewhere. One of these early card counters was Jess Marcum, who is described in documents and interviews with professional gamblers of the time as having developed the first full-fledged point-count system. Another documented pre-Thorp card counter was a professional gambler named Joe Bernstein, who is described in the 1961 book *I Want To Quit Winners*, by Reno casino owner Harold Smith, as an Ace counter feared throughout the casinos of Nevada. And in the 1957 book *Playing Blackjack to Win*, Roger Baldwin, Wilbert Cantey, Herbert Maisel, and James McDermott (known among card counters as "The Four Horsemen") published the first accurate blackjack basic strategy and a rudimentary card-counting system, devised solely with the aid of crude mechanical calculators—what used to be called "adding machines."

From the early days of card-counting, some players have been hugely successful, including Al Francesco, the inventor of blackjack team play and the man who taught Ken

Uston how to count cards, and Tommy Hyland, manager of the longest-running blackjack team in history. Ken Uston, though perhaps the most famous card-counter through his *60 Minutes* television appearance and his books, tended to overstate his winnings, as documented by players who worked with him, including Al Francesco and team member Darryl Purpose.

In the 1970s and 1980s, as computing power grew, more advanced (and more difficult) card-counting systems came into favor. Many card counters agree, however, that a simpler and less advantageous system that can be played flawlessly for hours earns an overall higher return than a more complex system prone to user error.

Teams

In the 1970s Ken Uston was the first to write about a tactic of card counting he called the Big Player Team. The book was based on his experiences working as a "big player" (BP) on Al Francesco's teams. In big-player blackjack teams a number of card counters, called "spotters," are dispatched to tables around a casino, where their responsibility is to keep track of the count and signal to the big player when the count indicates a player advantage. The big player then joins the game at that table, placing maximum bets at a player advantage. When the spotter indicates that the count has dropped, he again signals the BP to leave the table. By jumping from table to table as called in by spotters, the BP avoids all play at a disadvantage. In addition, since the BP's play appears random and irrational, he avoids detection by the casinos. The spotters, who are doing the actual counting, are not themselves changing their bet size or strategy, so they are relatively inconspicuous.

With this style of play, a number of blackjack teams have cleared millions of dollars through the years. Well-known blackjack teams with documented earnings in the millions include those run by Al Francesco, Ken Uston, Tommy Hyland, various groups from the Massachusetts Institute of Technology (MIT) and, most recently, a team called "The Greeks." Ken Uston wrote about blackjack team play in *Million Dollar Blackjack* (ISBN 0-89746-068-5), although many of the experiences he represents as his own in his books actually happened to other players, especially Bill Erb, a BP Uston worked with on Al Francesco's team. Ben Mezrich also covers team play in his book *Bringing Down The House* (ISBN 0-7432-4999-2), which describes how MIT students used it with great success. See also the Canadian movie *The Last Casino*, the American movie *21*, which was based on Mezrich's book, and more recently the 2011 American movie *Holy Rollers* at the *Internet Movie Database*.

The publication of Ken Uston's books and of his landmark lawsuits against the casinos, both stimulated the growth of blackjack teams (Hyland's team and the first MIT team were formed in Atlantic City shortly after the publication of *Million Dollar Blackjack*) and increased casino awareness of the methods of blackjack teams, making it more difficult for such teams to operate. Hyland and Francesco soon switched to a form of shuffle tracking called "Ace sequencing." Also referred to as "cutting to the Ace," this technique involves various methods designed to spot the bottom card during a shuffle (ideally an Ace) and expertly cut the deck and play future hands to force the player to receive the Ace. This made it more difficult for casinos to detect when team members were playing with an advantage. In 1994, members of the Hyland team were arrested for Ace sequencing and blackjack team play at Casino Windsor in Windsor, Ontario, Canada. It was documented in court that Nevada casinos with

ownership stakes in the Windsor casino were instrumental in the decision to prosecute team members on cheating charges. However, the judge ruled that the players' conduct was not cheating, but merely the use of intelligent strategy.

Shuffling machines

The introduction of shuffling machines that "randomly" shuffle decks (or at least "pseudo-randomly"), have been introduced by most casinos to defeat cheating (dealers & players colluding) and card-counters. Continuous Shuffling Machines (CSMs), which allow dealers to return the cards played to a single shoe, in particular make it quite possible for cards that were just played on the table to be re-shuffled to the top of the shoe, effectively rendering all card-counting schemes as useless.

Aces and eights



Two aces and two eights in a standard deck of playing cards. Credit: Tage Olsin, https://en.wikipedia.org/wiki/File:Dead_man%27s_hand.jpg, [CC BY-SA 2.0](https://creativecommons.org/licenses/by-sa/2.0/) license

Splitting **aces and eights** is part of blackjack basic strategy. Rules vary across gambling establishments regarding resplitting, doubling, multiple card draws, and the payout for blackjack, and there are conditional strategic responses that depend upon the number of decks used, the frequency of shuffling and dealer's cards. However, regardless of the various situations, the common strategic wisdom in the blackjack community is to "Always split aces and eights" when dealt either pair as initial cards. This is generally the first rule of any splitting strategy.

Splitting

The object of blackjack is for a player to defeat the dealer by obtaining a total as close to 21 as possible without accumulating a total that exceeds this number. In blackjack, the standard rule is that if the player is dealt a pair of identically ranked initial cards, known as a pair, the player is allowed to split them into separate hands and ask for a new second card for each while placing a full initial bet identical to the original wager with each. After placing the wager for the split hands the dealer gives the player an additional card for each split card. The two hands created by splitting are considered independently in competition against the dealer. Splitting allows the gambler to turn a bad hand into one or two hands with a good possibility of winning. It also allows the player to double the bet when the dealer busts. Some

rules even allow for resplitting until the player has as many as four hands or allow doubling the bet after a split so that each hand has a bet double the original. The standard rules are that when a bet is doubled on a hand, the player is only allowed to draw one more card for that hand.

Aces

A pair of aces gives the blackjack player a starting hand value of either a 2 or a soft 12 which is a problematic starting hand in either case. Splitting aces gives a player two chances to hit 21. Splitting aces is so favorable to the player that most gambling establishments have rules limiting the player's rights to do so. In most casinos the player is only allowed to draw one card on each split ace. As a general rule, a ten on a split ace (or vice versa) is not considered a natural blackjack and does not get any bonus. Prohibiting resplitting and redoubling is also common. Regardless of the payout for blackjack, the rules for resplitting, the rules for doubling, the rules for multiple card draws and the dealer's cards, one should always split aces.

Eights

If a player is dealt a pair of eights, the total of 16 is considered a troublesome hand. In fact, the value 16 is said to be the worst hand one can have in blackjack. Since sixteen of the other fifty cards have a value of 10 and four have a value of 11, there is a strong chance of getting at least an 18 with either or both split cards. A hand totaling 18 or 19 is much stronger than having a 16. Splitting eights limits one's losses and improves one's hand. Probabilistic research of expected value scenarios shows that by splitting eights one can convert a hand that presents an expected loss to two hands that may present an expected profit or a reduced loss, depending on what the dealer is showing. A split pair of eights is expected to win against dealer upcards of 2 through 7 and to lose less against dealer upcards of 8 through ace. If a player hits on a pair of eights, he is expected to lose \$52 for a \$100 bet. If the player splits the eights, he is expected to lose only \$43 for a \$100 bet.

History

Blackjack's "Four Horsemen" (Roger Baldwin, Wilbert Cantey, Herbert Maisel and James McDermott), using adding machines, determined that splitting eights was less costly than playing the pair of eights as a 16. They were part of a 1950s group that discovered that strategy could reduce the house edge to almost zero in blackjack. Now a typical strategy involves the following sequence of playing decisions: one decides whether to surrender, whether to split, whether to double down, and whether to hit or stand.

One of the earliest proponents of the strategy of splitting eights is Ed Thorp, who developed the strategy on an IBM 704 as part of an overall blackjack strategic theory published in *Beat the Dealer: A Winning Strategy for the Game of Twenty-One* in 1962. Thorp was the originator of the card counting system for blackjack.

Hole carding

Hole carding refers to obtaining knowledge of cards that are supposed to be hidden from view in card games. The term is usually applied to blackjack but can apply to other games with hidden hole cards, like three card poker and Caribbean stud poker. So long as it does not involve the use of a device like a mirror or actions like touching the dealer's cards, in most jurisdictions hole carding is a legal form of advantage gambling in casino table games. In other games, like stud poker, casinos normally have rules against rubbernecking or having a confederate stand behind an opponent to signal hole cards.

Blackjack players must usually make playing decisions based on only seeing one of the dealer's cards (the upcard). But if the dealer's hole card is spotted, a player who plays correctly has a theoretical advantage of up to 13% instead of the normal player disadvantage of around 0.5%. A hole-card player will often choose not to make certain plays, such as hitting a hard 19 against a dealer 20, so as not to reveal that he can see the dealer's hole card.

Dealers can thwart this strategy by turning their first card face-up and not dealing their second until the players have all played.

First-basing and spooking

One method of hole carding is to peek at the card when the dealer checks the hole card for blackjack. This is called "first-basing". A modification called "spooking" refers to a partner with a better view peeking at the hole card in the same circumstance and communicating the information to the player. Peeking devices have made these methods largely obsolete.

Front-loading

Front-loading refers to observing the hole card as it is slid under the upcard. Newer methods of hole-carding concentrate on observation before the down card is placed under the upcard. This provides information about the card even if the dealer upcard is not a ten or an ace. The advantage varies depending on the rules, the percentage of cards seen, and the strategies used.

Shuffle track

Shuffle tracking is an advantage gambling technique where a player tracks certain cards or sequences of cards through a series of shuffles. Shuffle tracking is typically done in blackjack games, although it can be done in other card games. Games with simple shuffles are generally easier to shuffle track than games with complicated shuffles. Thus, shuffle tracking is usually done in 6 or 8 deck shoe-dealt blackjack games, as these tend to have simpler shuffles compared to pitch games, due to the time required to accomplish a complicated shuffle on 6 or 8 decks of cards.

Shuffle tracking

Shuffle tracking is an advanced technique used with card counting. Many types of shuffle tracking exist. Generally, the player, or a team member, keeps track of the count (high cards versus low cards) of one or more subsections of the cards as they are played. The selected sections may or may not be predetermined by observing and mapping the shuffle. These sections are referred to as tracking zones. The player may attempt to follow slugs of cards through the shuffle, or have a good idea of the final location by previously analyzing the shuffle. After the shuffle, play zones exist which contain most of the cards in the tracking zone as well as other cards. The player can then cut zones with high cards into play, or with low cards out of play, thus changing the normal composition of the shoe. Betting can then be altered to reflect the altered composition.

Ace sequencing

Another form related to shuffle tracking is called ace sequencing, because it involves attempting to determine when an ace is about to be dealt. If a player knows that he will be dealt an ace as his first card, he gains a 50.43% advantage. This is because a player has about a 31% (depending on number of decks) chance of getting a blackjack and a good chance of making a strong hand if he is not dealt a blackjack. First the player should know what segments the discards are likely to appear relatively intact after a shuffle. He then observes aces as they are placed into the discard tray within a segment. He then remembers the two or three cards placed on top of the ace in the tray. These are called key cards. After the shuffle, the player looks for the key cards. The ace is likely to follow these cards and the player may be able to raise his bet in anticipation of receiving the ace.

Blackjack Hall of Fame



The Blackjack Hall of Fame at the Barona Casino. Credit: Visitor7, https://en.wikipedia.org/wiki/File:Blackjack_Hall_of_Fame.jpg, [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/) license

The **Blackjack Hall of Fame** honors the greatest blackjack experts, authors, and professional players in history. It was launched in 2002, and its physical premises are in San Diego, California.

History

The Blackjack Hall of Fame is housed at the Barona Casino, in San Diego, California. The Barona Casino awards to each inductee a permanent lifetime comp for full room, food, and beverage, in exchange for each member's agreement never to play on Barona's tables.

In winter 2002, a diverse selection of 21 blackjack experts, authors, and professional players were nominated for membership in the Blackjack Hall of Fame. The public was allowed to vote for about a month through the Internet. The final voting was completed at the January 2003 Blackjack Ball, an event open only to selected professional blackjack players and experts and hosted by blackjack author Max Rubin, whereby the first 7 members were inducted.

The following year, at the 2004 Blackjack Ball, 2 more inductees were added, again with primary voting done by professional gamblers at the Ball. Nomination of candidates, after 2006, has become the permanent responsibility of the members of the Blackjack Hall of Fame themselves. The Hall of Famers inducted 2 more members per year through 2006, and then agreed to drop to only 1 person per year.

However, in late 2007, 4 new members, were inducted in the Hall of Fame "as a group".

Inductees

The current members of the Blackjack Hall of Fame are the following:

- Al Francesco, 2002, one of the founders of the concept of blackjack teams.
- Peter Griffin, 2002, mathematician, theoretical pioneer and author of *The Theory of Blackjack*.
- Arnold Snyder, 2002, former professional player, author and editor of *Blackjack Forum*.
- Edward O. Thorp, 2002, author of the 1960s classic *Beat the Dealer*
- Ken Uston, 2002, professional player and author who popularized the concept of team play, often playing in disguise and successfully suing the Atlantic City casinos for the rights of card counters.
- Stanford Wong, 2002, author and popularizer of the strategy known as "Wonging".
- Tommy Hyland, 2002, manager of one of the longest-running blackjack teams.
- Max Rubin, 2004, expert and author, known for media reporting about gambling events, and optimizing casino comps.
- Keith Taft, 2004, inventor who manufactured hidden computerized devices to aid advantage play.
- Julian Braun, 2005, pioneering author who used computers to analyze blackjack statistics.
- Lawrence Revere, 2005, author of *Playing Blackjack as a Business* and blackjack teacher
- James Grosjean, 2006, computer analyst and professional player, author of the classic *Beyond Counting*, who successfully sued casinos and the Griffin Agency.

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- John Chang, 2007, former manager of the MIT Blackjack Team; was the basis for the Mickey Rosa character in the movie *21*.
- Roger Baldwin, Wilbert Cantey, Herbert Maisel and James McDermott, 2008, collectively known as "The Four Horsemen of Aberdeen" who, while serving in the U.S. Army in the 1950s, discovered and published in the *Journal of the American Statistical Association* the first accurate basic strategy for Blackjack, using only desk calculators.
- Richard W. Munchkin, 2009, blackjack and backgammon expert, author, film director and producer.
- Darryl Purpose, 2010, former professional advantage player and performing songwriter.
- Zeljko Ranogajec, 2011, professional gambler from Australia, former blackjack professional player.
- Ian Andersen, 2012, expert and author
- Robert Nersesian, 2013, Las Vegas lawyer specializing in lawsuits by players against casinos.

Glossary of blackjack terms

The following is a **glossary of terms used in the card game blackjack**. Besides the terms listed here, there are thousands of common and uncommon poker slang terms. This is not intended to be a formal dictionary; precise usage details and multiple closely related senses are omitted here in favor of concise treatment of the basics.

0–9

86'd

Being told by a casino that you are being removed due to card counting.

B

backdoor Kenny

When a player is first dealt a card valued at 10, then given an ace for the second card to complete the blackjack. Named for a dealer at the New York New York casino in Las Vegas, Nevada.

balanced count

Any counting system which has an exact balance between plus cards and minus cards. In such a system, if the deck were counted down to the bottom, the resulting sum would be zero.

blackjack

1. A card game in which players attempt to approach 21 but not exceed it
2. The best possible hand in the game blackjack, made up of an ace and a card valued at 10 (namely, 10, J, Q, K).

bust

Having a total over 21, resulting in an automatic loss.

bust card

The individual card that brings the hand's total over 21.

basic strategy

A collection of actions that will offer the highest return on investment when you know only your point total and the dealers upcard, basic strategy is set in stone, but may vary when different rules are applied to the game.

C

cut card

A brightly colored plastic card that serves to mark the point where the dealer will reshuffle the deck(s) / shoe, allow the player to cut the deck/shoe prior to dealing, and prevent the bottom card of the deck(s) / shoe from being exposed during play.

D

double or double down

After seeing his hand, a player can Double by placing an additional bet equal to his original bet and subsequently drawing one and only one additional card. This move may only be used on the first two cards.

E

even money

When the dealer shows an ace and the player has a blackjack, the player can opt for even money and is paid immediately at 1:1. This is just a version of insurance, not a different bet. If the dealer has blackjack, the hand is a push, but the player receives two times the value of the insurance, which is the same as the original bet. If the dealer does not have blackjack, the player wins 1.5 times the value of the original bet but loses the value of the insurance, and still ends up with the value of the original bet.

F

first base

The betting spot located to the ~dealers~ left hand side, which is first to receive cards and first to act.

H

hard hand

Any hand that does not contain an ace presently being counted as 11

hit

To ask for another card. If that extra card makes the total over 21, then the player busts.

hole card

The second card to be dealt to the dealer that is dealt face down and not revealed to players until after they have acted upon their hands

I

insurance

When the dealer shows an ace, the player can choose to place a side bet of half the value of the original bet. If the dealer has blackjack, the player gets his wager back plus the value of the original bet. If the dealer does not have blackjack, the player loses his wager.

P

penetration

A number or fraction that represents how many cards/decks will be dealt before shuffling in contrast to the total number of cards/decks in play. It may be expressed in percentage form or as a fraction where the denominator is always the total number of decks in play such as "4.5/6" or "75% penetration" In literature it may be abbreviated "PEN"

pitch game

A blackjack game dealt from the hand of the dealer using 1 or 2 decks

push

A tie; the player and dealer have hands with the same total.

S

shoe

A device used to hold multiple decks of cards typically 4,6 or 8 prior to the dealer removing them one card at a time to be used during play.

shoe game

A blackjack game which is dealt from a shoe. Shoe games typically use 4,5,6 or 8 decks.

soft

A soft hand is a hand that includes an ace valued as 11, as opposed to 1.

split

If a player is dealt two cards of the same rank, he can choose to play each of them separately, putting up a bet for each one.

stand

To stop asking for more cards.

stiff

Any hard hand where the possibility to exceed 21 exists by drawing an additional card namely 12,13,14,15 or 16

surrender

To surrender is to abandon your hand, while recovering half of your initial bet.

T

third base

The betting spot located on the dealer's right which is last to act.

U

upcard

The card that the dealer is showing.

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