

TABLE GAME PLAYER TRACKING DIAGNOSTICS: FINDING THE PROBLEMS

By Bill Zender

The first thing the new general manager did was ask to see a list of your big table games players. While combing through the data, he notices a “wide” discrepancy between table game players’ actual win and their theoretical win. The general manager questions the marketing manager and the table games manager at length. His main concern is why there is a substantially higher theoretical win than an actual win. Is the casino being cheated or ripped off? Are we comping our players too much? Is there an answer for this situation?

The two managers look at each other and shrug their shoulders. They never thought about the difference before. They thought it was just the way the computer calculated the theoretical, and that it wasn’t a big thing. The incoming general manager wasn’t so nonchalant about this issue. He wanted answers, and he wanted them yesterday.

As a manager, how do you go about investigating this situation? What do you look at first, the tracking system itself or the procedure used to collect the information? What are you looking for as a problem in the first place? What would cause the tracking system’s theoretical win to be that much different from the actual win?

Following are a list of areas that, based on my experience, have derailed the accuracy of a player tracking system. Some of the issues are linked to poor input metrics, some to input error and bad procedures. Other problems involve good procedures, but poor oversight by management. Do any of these problem areas exist in your casino?

Floor Person Judgment Mistakes Recording “Time On Game” Incorrectly

Probably the most common issue in customer rating, on any game type, is the system’s ability to accurately record the exact time the customer starts playing and when the customer quits play. Even with the newer card swipe systems, time recording can still be extremely inconsistent. To achieve a true measurement of time on game, the clock must start when the customer places his or her first bet, and must stop at the completion on the last hand of his or her play at the

table. Because the games aren’t totally digital, and because floor supervisors and dealers are occupied conducting other functions, we have to accept that close counts.

It’s the larger differences that hurt player tracking. These differences can usually be attributed to poor training of the person responsible for recording the rating, incorrect tracking procedures and lax oversight by pit management. It can also be attributed to game procedures that halt game play. For example, while conducting a player tracking system audit, I discovered a high-end blackjack customer who was tracked playing on a double deck blackjack game for 12 minutes. However, video review of his play showed he only played for five minutes. Why the big difference? The player was swiped into the system upon sitting on the game, but then had to wait five minutes before making his first bet due to a “no mid-game entry” rule.

In order to increase time on game accuracy, management needs to assign someone to spot check time in and time out by comparing the rating time input versus the actual time on game. If too big a discrepancy exists, management needs to assess the problem, determine the main causes of the problem and take action to correct the situation.

Incorrect Bet Average

Here’s another area where the lack of diligence creates a problem for the tracking system. Until either RFID technology improves or the games go totally digital, it will always be a challenge to come up with an accurate and workable average bet number. In most situations, the floor person starts a new player rating by recording the new player’s first wager. After that, they may be required to occasionally update the observed wagering amount. The exactness of this procedure has a tendency to deteriorate when the floor person is asked to watch a large number of games. How can management expect a floor person to keep track of four to five players per table when they are assigned to observe eight tables?

In lower limit games, close counts; however in higher limit games,

accuracy is extremely necessary. The difference in average bet is no longer \$5-10; it could range in the thousands. In some instances, the casino will assign someone to "bet tracking" the higher limit player. Bet tracking is the observation and tracking of each and every hand of a specific "big" player. Through bet tracking, the casino knows exactly how much money the player has placed in action during a recorded number of events. This method gives the casino 100 percent accuracy regarding average bet, hands played, total action, theoretical win and actual win.

To determine whether or not an acceptable average wager is being put into the tracking system, management needs to perform a random "rated versus actual" spot check. If a large discrepancy is noted—either too high or too low—the cause of this problem needs to be identified, and the error creating the dilemma mitigated through procedural change or training.

System Calculation Mistakes

Incorrect Game Mathematical Advantage

When conducting player tracking audits, I'm never surprised to discover the casino has the wrong mathematical house advantage put into their tracking system—blackjack especially. While putting a new tracking system into the Aladdin Hotel & Casino in the '90s, I got into a heated argument with the system installer. He wanted the system to calculate house advantage for the "average" blackjack player at 2 percent. When questioned as to how he arrived at that precise number, he explained that all the major casinos used it. When I asked him to change it to 1.5 percent (I later settled on 1.2 percent), he informed me rather rudely that I was wrong and I would be sorry for not listening to him. His total gaming experience was zero, and

he was only going by the systems default setting established in previous casino installs.

In order to establish an accurate theoretical win, management needs to input the correct mathematical game house advantage (H/A). For a number of casino games, arriving at a true H/A is a no-brainer. Games that have no true play strategy decisions involved are calculated mathematically. For example, double zero roulette is calculated based on the difference between the true payoff odds and the offered payout odds ($37 - 35 = 2$) and divide by the number of possible outcomes ($2/38 = 0.0526 = 5.26$ percent). This also goes for the game of craps, even though the number of different wagers creates a problem when simplifying a H/A through "averaging."

Player strategy games create a real problem since the input H/A has to assume the player uses a specific strategy. In games like Three Card Poker, determining the specific strategy and related H/A is easier than a game like Ultimate Texas Hold'em. In TCP, the strategy is fairly simple—stay in the hand with a Queen high or better. With UTH, you have a number of decision options and additional information from the flop, turn and river cards that appear after the initial betting round. Blackjack also has its strategy problems as well. Many tracking systems are set to reflect the games basic H/A, and do not take into consideration the error factor effect of the player (which also varies). In addition, the system is set for only one game type and one set of rules. A number of casinos have three or more variations of blackjack games, but rely on just a single H/A in their player tracking computer.

It's extremely important that management review the different game types mathematical house advantage settings in their player tracking system for correctness. One good source of information is

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GAMING OPERATIONS ■ table games

Michael Shackelford's www.wizardofodds.com website. The "Wizard" stays reasonably current with the addition of new game and side bet information. Another good source is Bob Hannum and Tony Cabot's casino mathematics and statistics book, *Practical Casino Math: 2nd Edition* (2005).

Incorrect Number of Hands per Hour

Many tracking systems have made assumptions regarding the number of rounds per hour dealt in blackjack, although they were never verified through actual observations. I still find tracking systems that are set with the average blackjack game producing 100 rounds per hour. How was this number determined? It was the default setting input into the tracking system when the program was installed. This would be an accurate figure if only three hands were played each round. The true average number of rounds in blackjack per hour is closer to 84. For years, table game tracking systems have been basing game calculations on inflated rounds per hour. A number of years ago, Tangam Gaming came up with a chart of rounds and hands played based on research they did at Barona Resort & Casino in Southern California. Tangam's information was developed over thousands of decisions recorded on six-deck shoe games and broken down by the number of player hands per round (See Chart 1).

Chart 1: Rounds/Hands per Hour

Hands Played	1	2	3	4	5	6	7
Hands dealt	220	282	313	334	350	364	376
Rounds dealt	220	141	104	84	70	61	54

What about other card games? In most cases, the system is programmed with the same number of rounds per hour as blackjack. Not all card games are created equal. For instance, blackjack, even with a full table, will achieve almost double the rounds per hour as a game such as Pai Gow Poker, especially if PGP utilizes a side bet. The hand decision utility in time and motion on blackjack is less than the hand decision utility on PGP. This is due to the time needed for the players to set two hands using seven cards versus the decision process used in a face-up blackjack. In addition, PGP is slowed even further due to the commission collection subject on each winning player hand. After viewing the dealing process, it stands to reason that the different card games will be dealt at a different pace, and this difference needs to be reflected in the tracking system settings.

Craps is probably the most incorrectly calculated casino game regarding rolls of the dice and decisions. Pass line and come wagers require the shooter to throw the dice approximately 3.3 times before a decision is determined. Unfortunately, many tracking systems list the number of "all" dice rolls an hour in their line/come calculations. Craps is also subject to a huge dice roll deferential between a busy game and a game catering to a couple of people. Time settings based on customer occupancy need to be established before hourly decision accuracy can be determined.

Procedure Mistakes

Estimating the Average Bet in Poker Style Games

In most cases, the designer of the game establishes the game's mathematical house advantage subject to the main game and the

bet that is on the table when the game starts. This bet is usually the ante bet. For instance, the game of Three Card Poker is designed with a mathematical edge of 3.3 percent, which is calculated based on the player's ante wager. Any subsequent wager, such as the "call" wager, is already calculated into the equation. Sometimes the floor staff incorrectly estimates the average bet using both the player's ante and call bet. Since the call bet is the same amount as the ante, their tracking system was giving the player double his or her theoretical win. This holds true for the other poker-style games. Ultimate Texas Hold'em has a published house advantage of 3.5 percent, which considers the ante wager only. The blind bet, and any subsequent wagers placed by the customer have already been factored into the "house advantage/ante bet" equation.

Not Considering the Effect of Side Betting

If your casino is offering side bets, you might as well build it into the equation. The problem is, most casinos don't want to take the time to calculate the effect, or they choose to ignore it altogether. Why offer a wager you want the customers to utilize, but don't want to reward them for doing so? In order to factor in the effect of the side bet on H/A, management needs to conduct observations to determine bet utilization and bet average. Then they need to increase the H/A of the game accordingly. Consider a blackjack game with a true H/A of 1.2 percent and an average player wager of \$25 that offers a side bet with 15 percent player utilization and \$5 average bet. First, multiply the average side bet of \$5 by the percentage of utilization ($\$5 \times 15\% = \0.75). Follow Chart 2, and you will see how the side bet affects blackjack's actual mathematical house advantage.

Chart 2: Side Bet Effect on Actual House Advantage

	Main Bet	Side Bet	Combined
Average Bet	\$25	\$0.75	\$26
H/A	1.20%	5%	n/a
Theo Win	\$0.30	\$0.04	\$0.34
Combined H/A			1.31%

Adding Odds Bets to Line/Come Bet Averages

This used to be a big problem 10 to 15 years ago, but the problem seems to be correcting itself for the most part. The bottom line is odds wagered in conjunction with pass line and come bets are not subject to a mathematical house advantage. If you can't profit from a bet in the long-term, you can't reward customers for betting on it. The customer should get credit toward their average bet for the line/come wagers only. Line/come odds are a promotional "gain" for the player, and are used as an independent incentive to attract play to the game. I don't care what the marketing department claims, there are no options on this issue; odds need to be ignored for tracking purposes.

Failure in Oversight Mistakes

Put All Missing Chips to the Big Player

I was asked to audit the player tracking system for a Native American casino in California. It was obvious that the player tracking system was exaggerating the "win" figure for a number of high-end players in baccarat. Although the problem turned out to be a grab

bag of issues, one of the bigger, self inflicted maladies resulted from management's need for the floor person to have accountability for all the \$25 chips and higher. When customers walked with chips and the floor staff couldn't figure out who left with them, they put all the missing chips to the biggest player at the table's rating. A number of higher end players were recording a couple of thousand dollars more in chips each session. It doesn't take long before these players start showing positive chip flow and overstated wins over the course of the year.

Purposely Failing to Record Cash Buy-Ins

This problem exists in many casinos that cater to high-end Asian play. Asian customers have a desire to wager with cash, and subsequently fall under cash reporting transactions. Most players despise the need for tracking their cash play, and will resort to all types of buy-in and cash-out tactics in order to stay away from the Title 31 Cash Transaction Report (CTRC) filing. The customers understand that the floor person is the casino representative who tracks their cash buy-ins. In some cases, the customers will work out an agreement with a specific floor person so not all his or her transactions are recorded. For "looking the other way," the floor person will receive a very generous "tip" from the customer. Without sounding like I'm profiling, the agreements are usually between the Asian player and an Asian floor person; however I've found all nationalities subject to this dangerous arrangement for avoiding elements of the Bank Secrecy Act. The best procedure for averting future problems with FinCEN and the IRS is to conduct periodic audits using video playback. Compare the cash buy-in information

on the customer's rating with what the observing audit notes in actual cash that is placed down the drop box.

Final Thoughts

If your casino intends to rate players correctly, it needs to periodically go back through its live game player tracking system, and make sure all the tracking metrics and input are correct. At the end of the year, if there is a big difference between the theoretical win calculation and the actual win, someone needs to go through the system and look for problems. Once problems are detected, solutions need to be determined to correct this errant situation. Any adjustments to the system need to be made based on research and facts; do not make "band aid" adjustments as a quick fix to the problem. It could result in more tracking inaccuracies and cost your casino operation thousands of dollars before management sees the errors of their ways.



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