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February 4, 2019

Mr. Carmi Halachmi, CEO  
Fifty Cats Ltd  
Hayakon 205  
Tel Aviv, Yafo 6340506  
Israel

Re: Mathematical Analysis of *Texas Flip* (GLI Europe B.V. Proposal #EU147310V2 dated November 5, 2018)

REF: MA-00-FCT-18-01

Dear Mr. Halachmi,

As per Fifty Cats Ltd's request, please find **Gaming Laboratories International, LLC's (GLI)** math analysis for the table game, *Texas Flip*.

**This report only verifies the mathematical aspects of this game and DOES NOT offer an opinion as to whether or not this game is currently authorized for use in any jurisdiction.**

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**Game Description**

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*Texas Flip* is a card game for up to 5 players, played with a standard 52-card deck. The Queen of Hearts is placed face-up in the dealer's hand, and the remaining 51 cards are shuffled. The player begins by placing two Ante wagers, in equal amounts. Optionally, they may also place a 4 Card Bonus wager, a Texas Flip Jackpot wager, and/or a Texas Flip Jackpot Progressive wager, according to casino configuration. Each player is then dealt two 2-card hands, face-up. Within each hand, one card is designated as the "bottom card" and one card as the "top card." The dealer then receives a second card, face-down, in addition to the pre-dealt Queen of Hearts. The player may choose to switch the top cards of their two hands with each other. The player may also choose to place Bet wagers on both hands, in amount equal to the Ante wagers. *Note that the player may not choose to place a Bet wager on just one hand.* The dealer then deals five cards to the table as community cards, and reveals their face-down card. All wagers are then resolved.



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MAIN WAGERS

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For each 2-card hand, the player makes their best 5-card Poker Hand using their two cards and the 5 community cards, as in standard Texas Hold'em. The dealer likewise makes their best 5-card hand. If a player hand beats the dealer hand, the associated Ante wager and Bet wager (if applicable) both win and pay 1 to 1. If a player hand ties the dealer hand, the Ante and Bet wagers push. If the player hand loses to the dealer hand, the Ante and Bet wagers lose. *Note that each player hand is resolved independently against the dealer hand, regardless of the other player hand.*

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4 CARD BONUS WAGER

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The 4 Card Bonus wager is resolved based on all four player cards. The wager wins if the hand meets one of the qualifying conditions, and pays by highest eligible scenario, as given in Table 1. Otherwise, the wager loses.

**Table 1. Pays — 4 Card Bonus**

Scenario	A1	A2	A3	A4	A5	A6	A7	A8
Four of a Kind	300 to 1	300 to 1	500 to 1	299 to 1	500 to 1	300 to 1	300 to 1	300 to 1
Straight Flush	100 to 1	100 to 1	100 to 1	100 to 1	100 to 1	100 to 1	100 to 1	100 to 1
Three of a Kind	15 to 1	15 to 1	20 to 1	20 to 1	20 to 1	20 to 1	25 to 1	25 to 1
Straight	10 to 1	10 to 1	15 to 1	15 to 1	15 to 1	15 to 1	15 to 1	15 to 1
Flush	8 to 1	7 to 1	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1
Two Pair	5 to 1	4 to 1	5 to 1	4 to 1	5 to 1	4 to 1	7 to 1	5 to 1
All Red or All Black	1 to 1	1 to 1	2 to 1	2 to 1	-	-	1 to 1	2 to 1
Pair	Push	Push	-	-	Push	Push	-	-

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TEXAS FLIP JACKPOT WAGER

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The Texas Flip Jackpot Wager is resolved twice, once for each of the player's two hands.

The Community Hand is defined to be the Poker Hand formed with the five community cards only. The Player Hand is the best hand formed using the community cards and the player's two hole cards. For the purposes of the Texas Flip Jackpot wager, if the Player Hand has the same ranking category as the Community Hand (e.g. both Flushes), then the hand is resolved as a Community Hand, even if the player cards may improve the hand within the ranking category. For example, if the community cards form a Full House of three Jacks and two Aces, and the player holds an additional Ace, the player can make a higher Full House (Aces full of Jacks), but the player cannot make a hand of higher rank than Full House. This would still be considered a Community Full House.

For each of the player's hands, if either the Community Hand or the Player Hand forms a Straight or better, then the player receives a pay for the highest eligible scenario in [Table 2](#).

**Table 2. Pays — Texas Flip Jackpot**

<b>Scenario</b>	<b>Pay</b>
Player Royal Flush	100 × wager
Player Straight Flush	50 × wager
Player Four of a Kind	10 × wager
Player Full House	5 × wager
Player Flush	3 × wager
Community Straight or Better	2 × wager
Player Straight	1 × wager

If either or both of the player's two hands qualifies for a pay above, then the player's wager is returned to them in addition to their winnings.

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TEXAS FLIP JACKPOT PROGRESSIVE WAGER

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The Texas Flip Jackpot Progressive Wager is resolved twice, once for each of the player's two hands. If the best 5-card hand is a Straight or better, the player receives an award according to hand ranking, as given in [Table 3](#). *Note that the wager itself is not returned to the player, regardless of whether one or more awards are earned.*

**Table 3. Pays — Texas Flip Jackpot Progressive**

<b>Hand</b>	<b>Pay</b>
Royal Flush	100% Prog.
Straight Flush	10% Prog.
Four of a Kind	10 × wager
Full House	5 × wager
Flush	3 × wager
Straight	1 × wager

A specified percentage of each wager increments the progressive meter. The meter is reseeded by the specified amount in the event of a 100% progressive award. Progressive configuration details are listed in [Table 4](#) for a \$1 wager amount. If the wager is configured at a different amount, the Seed/Reseed value should be scaled appropriately.

**Table 4. Progressive Configuration — Texas Flip Jackpot Progressive, \$1 Wager**

Seed/Reseed Value	\$1,500
Increment	14%

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## Mathematical Analysis

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The analysis for *Texas Flip* was conducted by computer program.

For the main wagers, initial deals were simulated. For each deal, optimal Bet and Switch strategy was determined through further simulation. This strategy was then executed, and the results were collected. Note that the strategy is dependent on the cards the player can view, so that a somewhat better strategy can be executed with more players at the table. A return summary is presented in [Table 5](#). In the table, RTP represents the Return to Player, which is the ratio of Average Win to Average Wager. RTH represents the Return to House, also known as the Element of Risk, and is the expected House earnings scaled relative to the Average Wager. The HE is the traditional House Edge measurement, scaled relative to the Initial Wager.

**Table 5. Return Summary — Main Wagers**

<b>Number of Players</b>	<b>1</b>	<b>5</b>
Initial Wager	2	2
Average Wager	2.5727	2.7244
Average Win	2.5178	2.7020
RTP	97.87%	99.18%
RTH	2.13%	0.82%
HE per Initial Wager	2.74%	1.12%

For the 4 Card Bonus Wager, the analysis was done by using a program to iterate through all possible 4-card hands and tallying directly the probability of each winning event. A summary of probabilities is presented in [Table 6](#). These probabilities were combined with pay information to produce returns, a summary of which is given in [Table 7](#). Note that the probability of a Pair for paytables A5 and A6 is higher than for the other paytables because hands that are all one color and contain a single Pair are resolved as Pairs for A5 and A6, but are resolved as All Red or All Black for the other paytables.

**Table 6. Probability Summary — 4 Card Bonus**

<b>Scenario</b>	<b>A1 - A4, A7, A8</b>	<b>A5, A6</b>
Four of a Kind	0.000048	0.000048
Straight Flush	0.000164	0.000164
Three of a Kind	0.009220	0.009220
Straight	0.010336	0.010336
Flush	0.010400	0.010400
Two Pair	0.010372	0.010372
All Red or All Black	0.098155	-
Pair	0.278896	0.304250

**Table 7. Return Summary — 4 Card Bonus**

	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A4</b>	<b>A5</b>	<b>A6</b>	<b>A7</b>	<b>A8</b>
RTP	92.33%	90.25%	87.07%	85.07%	88.05%	86.05%	82.98%	90.72%
HE	7.67%	9.75%	12.93%	14.93%	11.95%	13.95%	17.02%	9.28%

For the Texas Flip Jackpot and Texas Flip Jackpot Progressive wagers, the returns are influenced by the player's switch strategy. A strategy program was used to determine the maximum possible RTP if the player optimized their return on the optional wager alone, disregarding any possible impact to their main wager. Return summaries are presented in [Table 8](#) and [Table 9](#).

**Table 8. Return Summary — Texas Flip Jackpot**

<b>Number of Players</b>	<b>1</b>	<b>5</b>
RTP	90.12%	90.75%
HE	9.88%	9.25%

**Table 9. Return Summary — Texas Flip Jackpot Progressive**

<b>Number of Players</b>	<b>1</b>	<b>5</b>
RTP	91.30%	91.74%
HE	8.70%	8.26%

Note that if a player places a Texas Flip Jackpot or Texas Flip Jackpot Progressive wager, then their overall optimal strategy would be a compromise between the returns on the main wagers and the Texas Flip Jackpot wager. The resultant blended strategy would be impacted by the ratio between base wager and Texas Flip Jackpot wager. Since the Texas Flip Jackpot wagers offer lower returns than the main wagers, and would not be placed by an optimal player, the exact impact of the blended strategy was not further investigated.

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## Summary

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Overall, *Texas Flip* offers several RTPs, according to configuration and number of players at the table. The best overall RTP is 99.18%, observed when the player places the main wager only, when the maximum of 5 players are at the table, and when the player optimizes their Switch and Bet decisions appropriately. The lowest individual wager RTP is 82.98%, from payable A7 of the 4 Card Bonus wager.

It should be noted that this evaluation does not cover the review or use of the progressive equipment itself.

*Texas Flip*

MA-00-FCT-18-01-000

GLI-1

Page 7 of 7

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Should you have any questions, please feel free to contact our office.

Sincerely,

**GAMING LABORATORIES INTERNATIONAL, LLC**

A handwritten signature in black ink, appearing to read 'CM Gallo', is centered on a light gray rectangular background.

Christine M. Gallo

Vice President of Technical Compliance and Quality Assurance

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