# On the Subject of Rigging the Odds

That's right, we're gonna cheat!

You and 29 others have the opportunity to win big in a random three-digit number drawing. The catch is, you've found a way to cheat the system. As long as you can figure out the winning number in advance. Each of the 30 stations have a unique random three-digit number tied to it, referred to as its *"chance number"*. To solve the module, work out the winning number for the upcoming drawing, then commit to the station with the chance number that matches or is closest to the winning number.
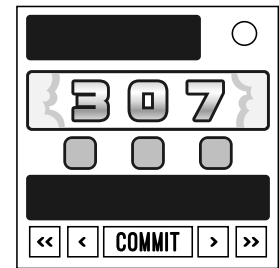
This module contains (from top to bottom):

- A screen displays the current station you are on.
- A screen with that station's chance number.
- Three small monitors that will show the winning numbers once you have committed to a station.
- A two-row matrix display that will show information about the upcoming drawing, mainly the time, buy-in, and jackpot payout.
- A row of five buttons (from left to right):
  - Decrease the station number by 5.
  - Decrease the station number by 1.
  - Commit to your current station and reveal the winning number, acts as a submit button.
  - Increase the station number by 1.
  - Increase the station number by 5.

Note: Stations wrap around. 30 loops around to 1 and vice versa.

After viewing a station for the first time, any future viewings of that station will have its chance number hidden. That chance number cannot be viewed again unless you get a strike. It is important that the defuser relays information about the stations they view while navigating to avoid getting lost. However, this does *not* apply to the *Starting Station* (the station you start at when the module arms, indicated by the words "STARTING STATION" at the top), which will always show its chance number regardless of how many times it's viewed. If you commit to the station with the number that either matches the winning numbers, or comes the closest to matching out of all 30 stations, the module will solve. Committing to an incorrect station will cause a strike, unhide all previously hidden chance numbers, change certain information on the two-row matrix display, and turn the station you committed to into the *new* Starting Station.

Step 1: Searching for the Key Station

First, locate the Starting Station's number on one of the cells in the hexagonal grid. If its chance number is less than 500, non-inclusive, use its topmost* instance on the grid. Otherwise, use the bottom-most* instance. Then, using that station's move in every direction with a condition that is true in the "Stage 1" column in the table below, starting from top to bottom. Then, starting from where you landed in Stage 1, repeat this process for Stage 2, and so on. If at any point, you need to move past an edge, wrap around to the opposite side of the grid. (i.e. $29 \rightarrow_{xy} 21$, etc.) If at the end of a stage, you end at the same cell you started on, move forward 1 extra cell in the last direction you moved (unless no moves were made that stage, see below).

If both occurrences are in the same row, the leftmost occurrence is considered the topmost.

If at any point you need to move into the center cell, skip over it. Do not count it as a move.

For example, if you are on cell 27 (second occurrence) and you need to move three cells in the "x" direction, you would skip over the center and land on cell 28, not cell 24.

KEY: A_N, B_N, and C_N represent digits ABC of the chance number being used for Stage N. Stage 1 uses the chance number from the Starting Station. Stages 2 and 3 use the chance numbers from the stations landed on at the end of Stages 1 and 2 respectively.

Stage 1 Move 1 cell per direction	Stage 2 Move 2 cells per direction	Stage 3 Move 3 cells per direction
x: $A_1 \% 2 = 0$	**x:** $A_2 = [A_1 \text{ or } B_1 \text{ or } C_1]$	**x:** $|C_1 - C_2| > C_3$
xy: $|B_1 - C_1| < 5$	**xy:** $ABC_2 > ABC_1$	**xy:** $C_3 - A_3 < 0$
y: $A_1 > C_1$	**y:** $B_2 > B_1$	**y:** $B_3 \% 2 = B_2 \% 2$
yz: $ABC_1 > 499$	**yz:** $C_2 + A_2 > 9$	**yz:** $B_3 + C_3 > B_2 + C_2$
z: $B_1 + A_1 > C_1$	**z:** $|A_2 - B_2| < |A_1 - B_1|$	**z:** $ABC_3 > ABC_2$
xz: $C_1 \% 2 = 1$	**xz:** $C_2 \le C_1$	**xz:** $A_3 \ge [A_2 \text{ and } A_1]$

If no conditions in a Stage apply, move exactly one space in the "x" direction.

The station you land on at the end of Stage 3 is the Key Station, and its chance number will be referred to as the Key Chance Number, or *KCN*.

Step 2: Determining the Winning Number:

Once you obtained the Key Station, use its chance number (KCN) in conjunction with the information shown on the matrix display to determine the winning number. Each digit of the KCN is being manipulated by a simple mathematical operation.

First Digit:

Find the intersection between the *minutes* in the Time of Draw time and the Buy-In amount. Apply this operation to the *first* digit of the KCN.

	:00	:05	:10	:15	:20	:25	:30	:35	:40	:45	:50	:55
1-9	-2	$+3$	±5	$+2$	$+A_1$	$+2$	$+A_1$	-3	$+4$	$-A_1$	$+2$	-4
10-24	$+4$	$+1$	±0	$+1$	-2	±5	$+A_3$	$-A_3$	-1	-4	-4	-2
25-49	$-A_1$	$+3$	-1	-3	-4	-1	±0	$+4$	±0	$+1$	$+4$	$+3$
50-74	±5	±5	$+4$	$-A_3$	$-A_2$	-3	-1	$+A_3$	-1	$+2$	±0	-3
75-99	$+A_2$	±0	-1	±0	$+A_2$	±5	$+3$	$+2$	$+1$	$+1$	-2	$+4$
MAX (100)	-4	-3	$+2$	$-A_2$	$+3$	$+2$	-2	$+1$	-3	±5	$+3$	-4

Second Digit:

Find the intersection between the Buy-In amount (leftmost column that is true) and the Jackpot Payout* (topmost row that is true). Apply this operation to the *second* digit of the KCN.

	<10	<20	<30	<40	<50	<60	<70	<80	<90	≤MAX
less than 1k	$+B_2$	$+3$	-3	-4	-4	±0	$+2$	±0	$+4$	$+4$
less than 5k	-2	$-B_3$	-3	$+1$	-3	$+B_1$	±0	$-B_2$	$+B_3$	±0
less than 10k	-2	$+B_3$	-4	$+4$	$+2$	$+1$	±5	±5	$+3$	$+B_1$
less than 25k	-2	$+1$	-3	$-B_1$	$+1$	-4	-2	-4	-2	$+2$
less than 50k	±5	$+1$	-1	±5	-4	$+4$	-1	$+3$	$-B_3$	$+2$
50k or more	-3	$-B_2$	$+2$	$+4$	-1	±0	$+3$	±5	$+3$	-1

Third Digit:

Find the intersection between the *minutes* in the Time of Draw time and the Jackpot Payout* (topmost row that is true). Apply this operation to the *third* digit of the KCN.

	:00	:05	:10	:15	:20	:25	:30	:35	:40	:45	:50	:55
less than 1k	+2	±0	−1	+2	−4	$+C_2$	$-C_2$	±0	−2	−2	$+C_3$	−2
less than 5k	+4	+4	±5	−1	±0	+1	+3	$-C_2$	+4	+1	+2	+3
less than 10k	±0	±5	+4	−3	+1	−3	−1	−4	−3	$-C_3$	$-C_1$	−1
less than 25k	−4	+2	−2	−3	−4	+1	−4	+3	+4	−4	±0	−1
less than 50k	+2	−2	$+C_3$	+2	±0	$-C_1$	+1	$+C_1$	−3	±5	±5	+1
50k or more	$-C_3$	$+C_2$	+3	$+C_1$	+3	±5	+4	+3	−1	−2	−3	±5

*Note that the Jackpot Payout is constantly increasing. You may need to recalculate some digits if this number crosses into a different range in the tables.

Apply the three calculations above to their respective digits. If a digit's solution goes above 10, use its least significant digit. If a digit's solution falls into negatives, add 10 until it is positive. This final three-digit number is the winning number. **If there is a station with a chance number that's an exact match to the winning number, commit to that station immediately.** Otherwise, see the next section to determine which station is the closest.

Step 3: Determining the Closest Station:

If there are no stations present with an exact match, then you will need to find the station with the next closest chance number. However, the "closest" by definition may not necessarily be the closest numerical value. See the table below for what combinations take precedence over other combinations. The table is sorted from highest priority to lowest priority. Commit to the station in the highest applicable row.

If multiple stations are tied in the highest applicable row, you will need to break the tie. The station considered the closest is the one with the smallest difference* between its chance numbers' [n]th digit and the [n]th digit of the winning number. The digit that needs to be focused on is specified in that row's "Tiebreaker" line. If there is still a tie after exhausting all tiebreaks for the highest row, then committing to any of the stations that are still tied after tiebreaks will count as correct.

Digit Matches			Description
✓	✓	✓	**Exact match.** Commit to this station immediately if you haven't already.
✓	✓	–	**First and second digit match.** Tiebreaker: Third digit
✓	–	✓	**First and third digit match.** Tiebreaker: Second digit
–	✓	✓	**Second and third digit match.** Tiebreaker: First digit
✓	–	–	**First digit match, only.** Tiebreaker: Second digit (then third if still tied)
–	✓	–	**Second digit match, only.** Tiebreaker: First digit (then third if still tied)
–	–	✓	**Third digit match, only.** Tiebreaker: First digit (then second if still tied)
–	–	–	**No digits match.** If none of the 30 stations have any matching digits, then the closest station is the one with the smallest difference* between its chance number and the winning number, using the entire numerical value instead of any specific digit.

Please note that when calculating these differences, use the absolute value for each. No negatives.