



GEORGE JOSEPH

DYNAMIC.  
REVEALING.  
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Hello \*\*\*\*\*,

As you know, a group of security researchers recently undertook a project to attempt to hack the Deckmate 2 Shuffle Machine...Specifically for the game of Texas Hold Em' Poker.

### Hackers Rig Casino Card-Shuffling Machines for 'Full Control' Cheating

AUG 9, 2023 6:00 PM

Security researchers accessed an internal camera inside the Deckmate 2 shuffler to learn the exact deck order—and the hand of every player at a poker table.



With a tiny hacking device slipped into a shuffling machine's USB port, which often sits exposed under a poker table, IOActive's researchers showed they can carry out omniscient cheating in a game like Texas Hold Em

They ultimately found that if someone can plug a small device into a USB port on the most modern version of the Deckmate—known as the Deckmate 2, which they say often sits under a table next to players' knees, with its USB port exposed—that hacking device could alter the shuffler's code to fully hijack the machine and invisibly tamper with its shuffling. They found that the Deckmate 2 also has an internal camera designed to ensure that every card is present in the deck, and that they could gain access to that camera to learn the entire order of the deck in real time, sending the results from their small hacking device via Bluetooth to a nearby phone, potentially held by a partner who then could then send coded signals to the cheating player.]

-2- Memo Deckmate

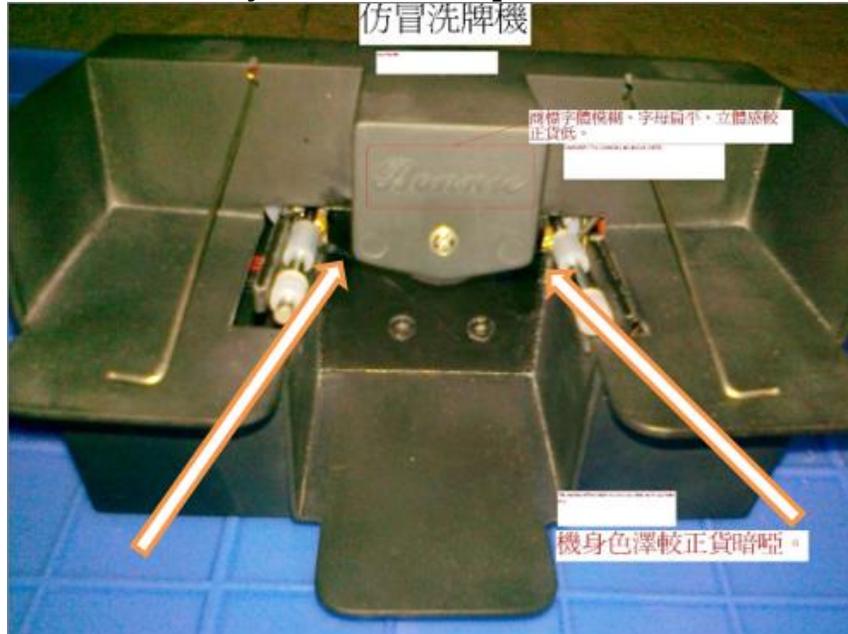
This hack and technology although very intriguing sounding are not new. You might remember that a camera hack was uncovered in Macau a few years ago in Baccarat. With the help of an inside guy a miniature camera was installed at a point in the shuffle machine to record the last pass of the shuffle up.



The Macau Police Judiciary busted 7 Chinese nationals in March for cheating unnamed casinos on the island out of the equivalent of \$3 million U.S. dollars, by secretly installing mini-cameras and reflective mirrors in automatic card-shufflers at baccarat tables. The camera rig wirelessly beamed video images of card order to a game analyst at an off-site hideout. Determining card order by analyzing the video took 1 to 2 hours, at which time the analyst then sent cheat instructions to accomplices via **mobile phone**. Casino employees discovered the cameras during routine maintenance in January, with the perpetrators finally arrested in March. Suen Kam-fai of the Macau Judiciary Police told the Hong Kong newspaper, The Standard that syndicate members switched the doctored machines into games by using distraction techniques...**???** The Police Judiciary is still investigating whether dealers were complicit in the scam.

-3- Memo Deckmate

Macau shuffle machine was hand carried from game to game to “*Shuffle*” already pre-shuffled factory Bricks...As a precaution...



The shuffle machine the group attacked was one step up from a simple home unit. Playing cards were stacked on the left & right sides and simply fed back to the middle via rubber rollers.

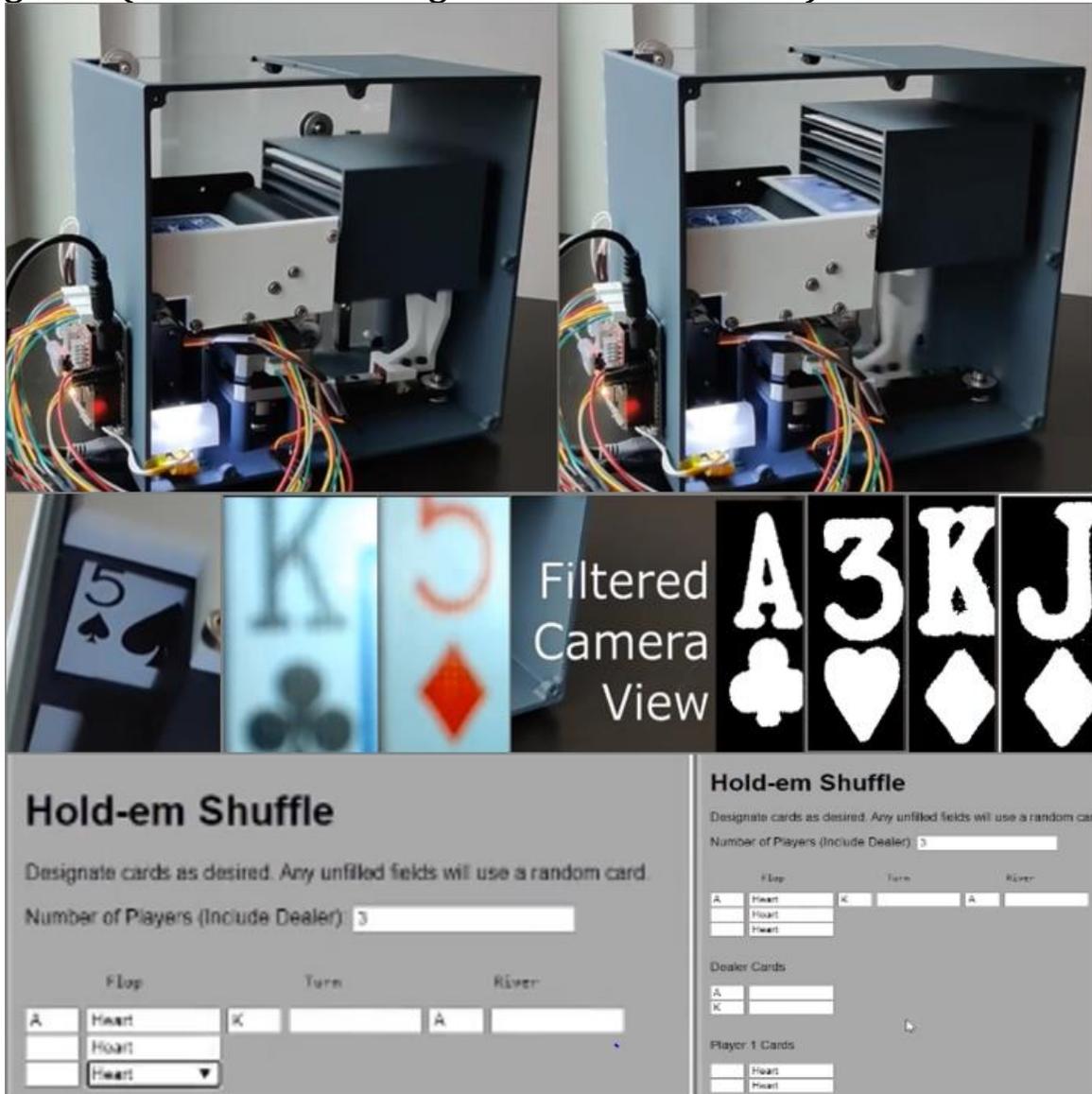


Home Card Shuffler

Casino Card Shuffler

-4- Memo Deckmate

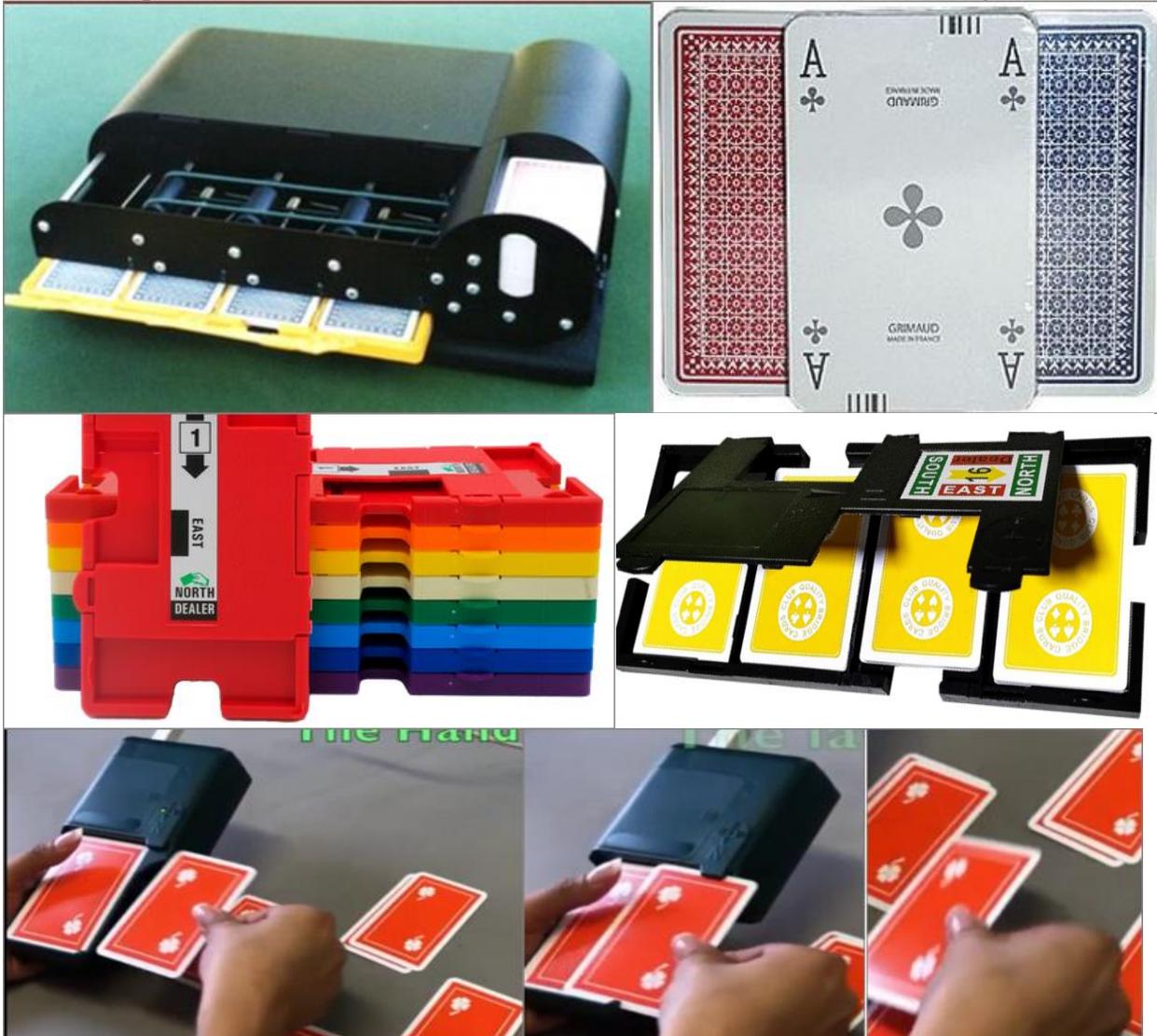
For completeness' sake: Pictured below is a card shuffler designed to allow any "Called For" cards to be dealt in any Called For Hand in any game...(One Function is Legal - No Function Is Not)



One application of the above shuffler is that predetermined cards can be assigned in advance to any position for a known outcome. Additionally, playing cards could be read during the shuffle and values and sequences could be transmitted. The above machine could be used to cheat, or for use in Duplicate Bridge Tournament Play.

-5- Memo Deckmate

**BTW: There is a legitimate reason to predetermine playing cards in exact hands. The game of Duplicate Bridge requires that each customer seated in position one (1) on all tables in the tournament must receive the same exact 13 (Unknown) card hand to begin. Every player in positions 2, 3 and 4 must begin with the same 13 cards as all other table positions 2, 3 and 4. To accomplish this requirement, a shuffle machine known as a Duplimate was invented. A shuffled (or new deck) is read by the machine and playing cards are sorted into four compartments. Compartment one (1) of each colored board has the exact same 13 Cards (not in exact order) as every other compartment one and so on...2, 3 & 4. There is also a hand delivery version...**



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Keep in mind, that even though every position (1,2,3, & 4) has the same exact 13 card starting hand...No one knows the position any playing card(s) when first delivered.

**Ideal Shuffle Machine:**

It should be noted that the IDEal Shuffle Machine provides a function which allows a printout of customers initial hands.



The obvious intent of this feature is to allow casino management to verify winning hand integrity before approving a Jackpot Payoff.



**Partner Card Switch to Steal a Jackpot Payoff**

In the above example, the print out of hands from the machine will not match the customers cards on the layout... (Good Game Protection)

-7- Memo Deckmate

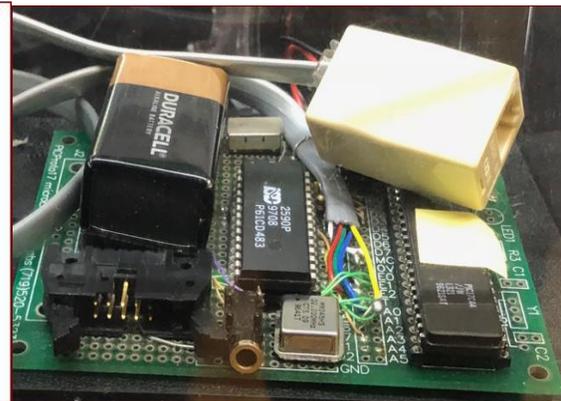
**I will agree this On-Board Printer is a strong game protection feature in this regard. (Protection against Hand Mucking).**

**Keep in mind however, the manufacturer is conceding the fact that at some point in the shuffle process the exact order of cards and/or hands is known in advance. If any shuffle machine has the capacity to suit & sort and/or verify deck completeness and/or record initial hand composition, then it is academic that a technology is employed (camera or barcode scanner) to record the card index values. If what was reported is true...It appears this is the operation (of the Deckmate 2) into which these security investigators have hacked. The hackers utilized a Raspberry Pi (mini computer) attached via an exposed USB port and proprietary software.**

**BTW: Mini-Microprocessors used to cheat in casinos are not new**



**Raspberry PI circa 2023**



**Weeks Slot Hack Device Circa 1989**

**(NOTE: I question why a venerable USB port would be exposed...?)**

**FYI: I was asked a couple of years ago to look into similar accusations of a suspected camera hack of the IDEal shuffle machine. I will compile a memo and send it soon.**



**GEORGE JOSEPH**

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**-8- Memo Deckmate**

**I will continue to look into this matter and update you.**

**Talk with you soon...**

**Respectfully Submitted,**

**George D. Joseph  
Worldwide Casino Consulting, Inc.**

**GJ/ccj**