

Cheating at poker James Bond Style

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Spectre

Inception



This busted up poker in east texas a few years ago. Maybe 5 years ago now. A group of guys got away with it for almost a year before one of them spilled the beans to someone and everyone found out. Poker was everywhere here before that, but the cheating turned all the recreational players off and they won't play anymore. Really sucked. Some estimate the guys made 70k before they were caught. No one really knows. Dealers and 1 or 2 hosts were in on it. Some hosts had no idea what the dealers were doing. These were 1-2 NLHE games, maybe some 2-5 games. People were already suspicious before it came out. Someone calls an all in preflop with 9-2o vs KK because they knew they'd be best in the end. Something was up. From how I understand the cheating players had an ear piece and it told them, seat 4-1st place, seat 8-2nd, seat 1-3rd and so on. Really a crap move. Ruined the game for everyone.


3
A
5
7
9
-40%
Best Deal
€4,980
Gambling predictor number
View details
21 Blackjack Predictor
Winning hand is: 3
Second hand is: 4
-40%
Best Deal
€4,980
Blackjack winner scanner predictor
View details
-60%
Best Deal
€6,070
Cigarette lighter & barcode rummy
View details


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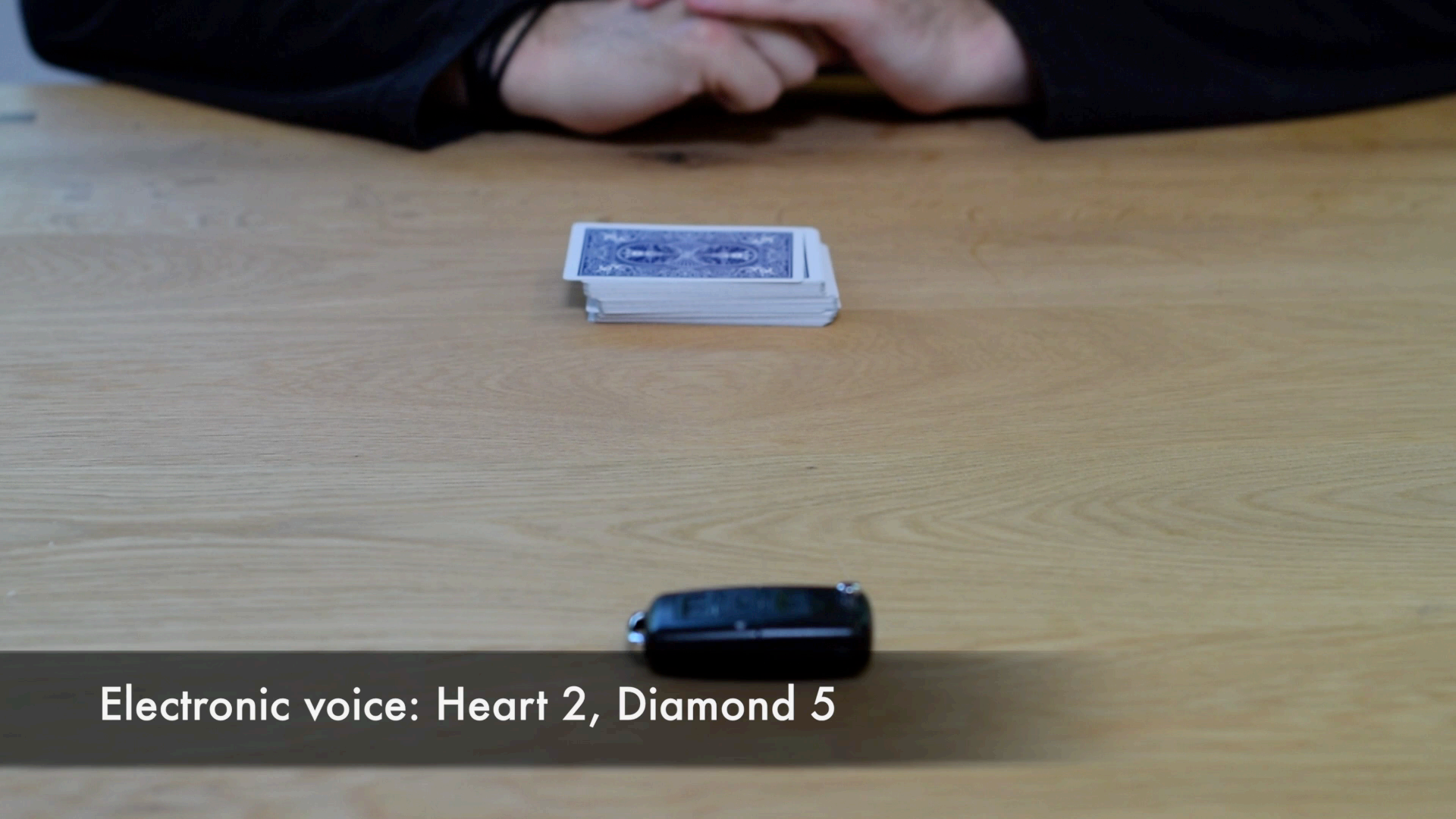
Electronic voice: Heart 2, Diamond 5



Device




SAMSUNG
12:45
12:45 PM
Thu, March 14
London
Sunny
23°C
Google
Email
Camera
Samsung Apps
Play Store
Phone
Contacts
Messaging
Internet
Apps
SAMSUNG
www.GSMArena.com

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Visible differences



Galaxy Core



Poker cheating device

Security measures

Activation code sent separately

Prevent activation of a “lost" device

ADB / debug mode gone

No “easy" way to get the APK / analyze what is happening

Screenshot shortcut disabled & framebuffer owned by root

Prevent to do screenshot / screencap either via SSH or UI

Fun facts

Custom rom with custom kernel

Chinese 4.2.2 Jelly Bean ROM AOSP

Cheating hardware hidden from the UI/system

No way to trigger the system without the correct application / setup

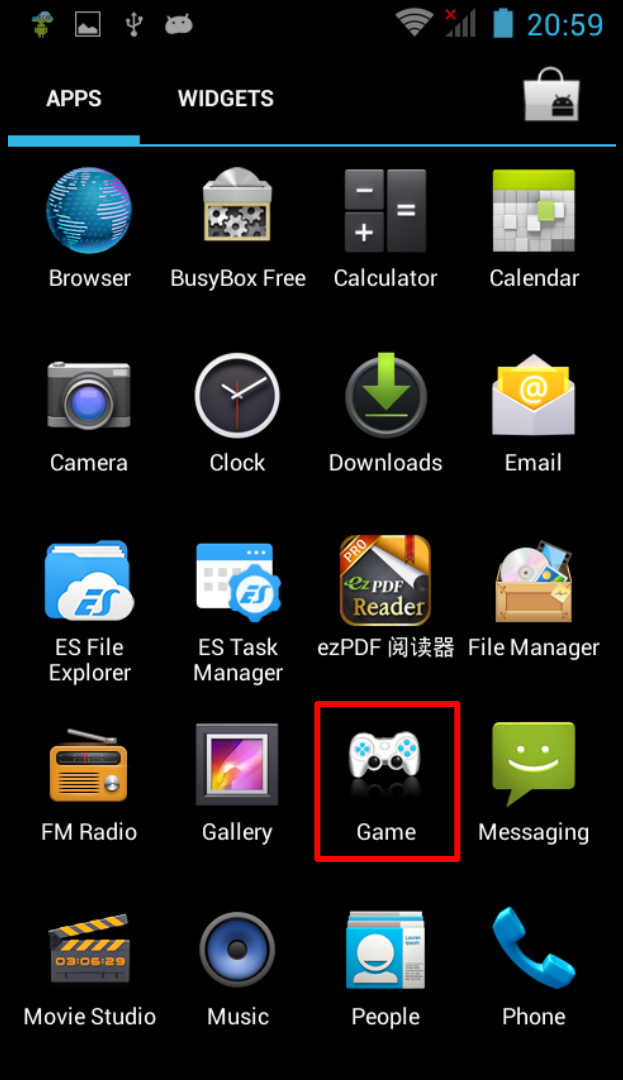
Backdoor? No need for network or SIM

Lots of phone home code in the APK and lot of weird APK in the phone

App walkthrough



Casino royale


20:59
APPS
WIDGETS
Browser
BusyBox Free
Calculator
Calendar
Camera
Clock
Downloads
Email
ES File Explorer
ES Task Manager
ezPDF 阅读器
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FM Radio
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Game
Messaging
Movie Studio
Music
People
Phone

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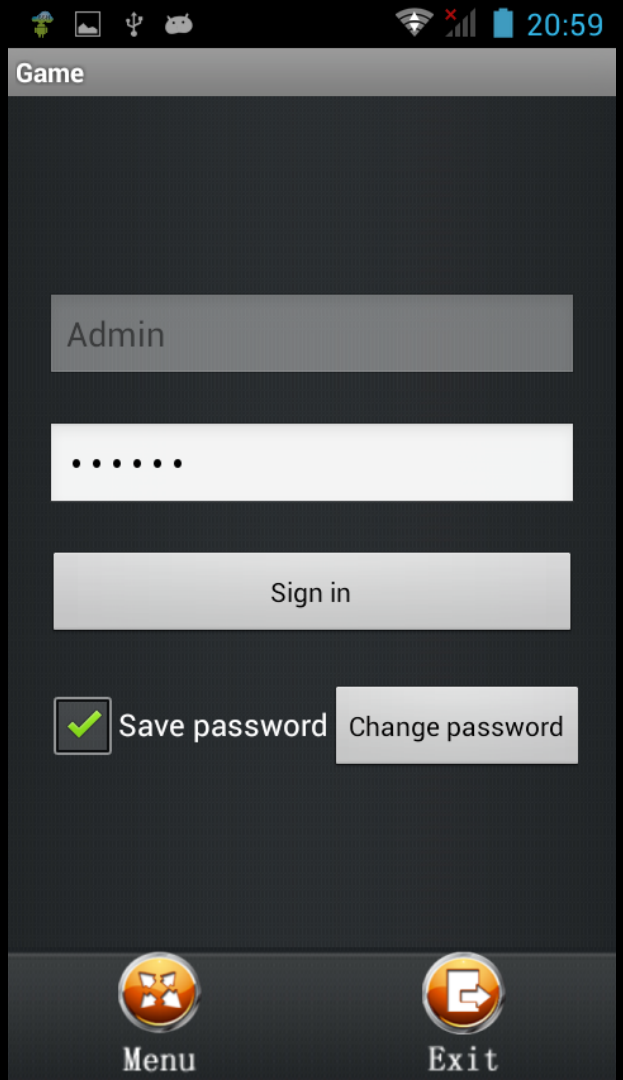
20:59
Game
Admin
Sign in
Save password
Change password
Menu
Exit

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20:59
Game
Game Hall
Purchased
Common Game
Upgrade
System Info
Setting
Menu
Exit

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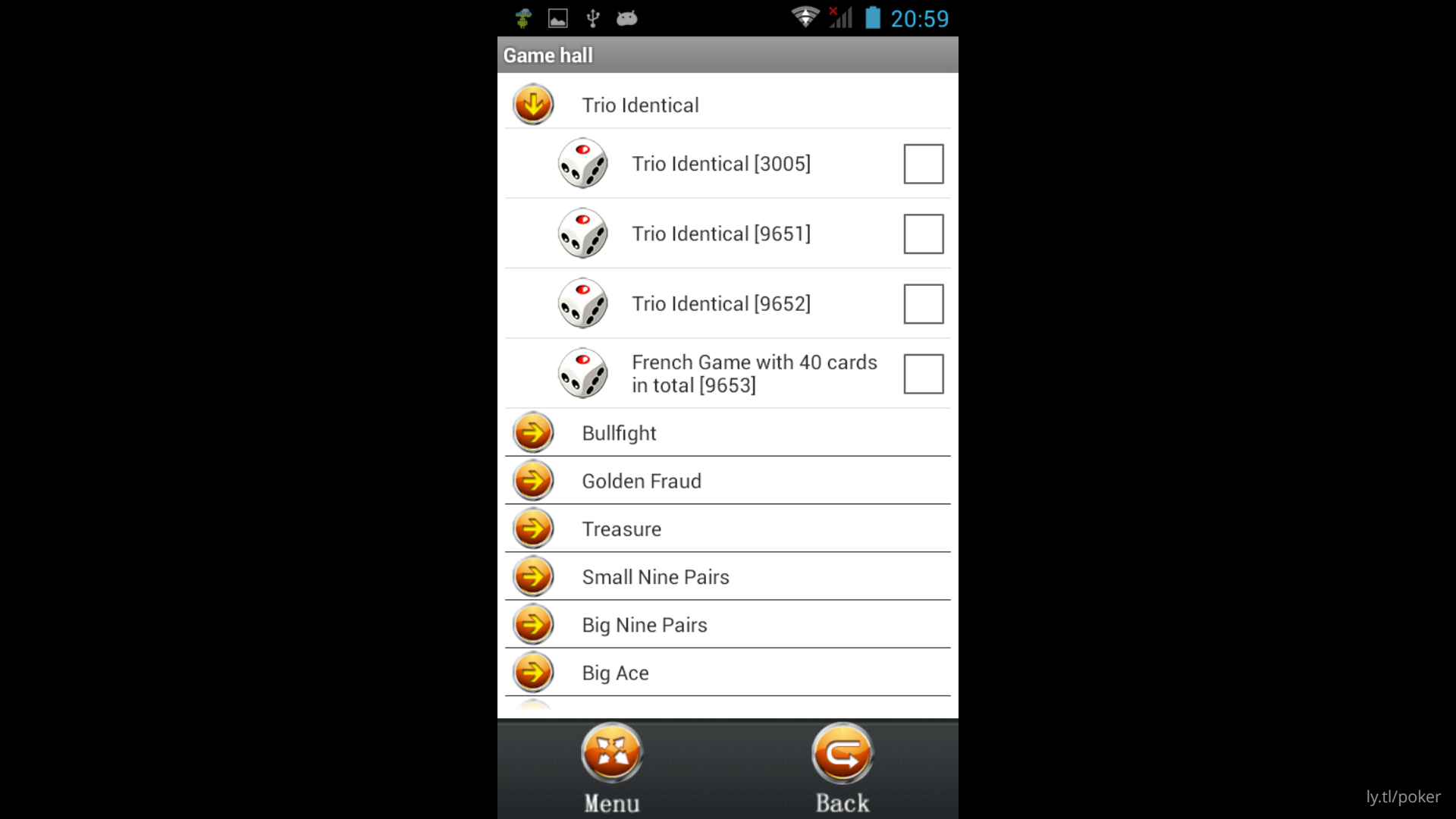
20:59
Game hall
Trio Identical
Trio Identical [3005]
Trio Identical [9651]
Trio Identical [9652]
French Game with 40 cards in total [9653]
Bullfight
Golden Fraud
Treasure
Small Nine Pairs
Big Nine Pairs
Big Ace
Menu
Back

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Has purchased the game

Can buy the game number：3 Has purchased the game number：2

1. 7-card Texas Hold'em poker [7003]

2. Read the card directly [1016]


Menu


Back

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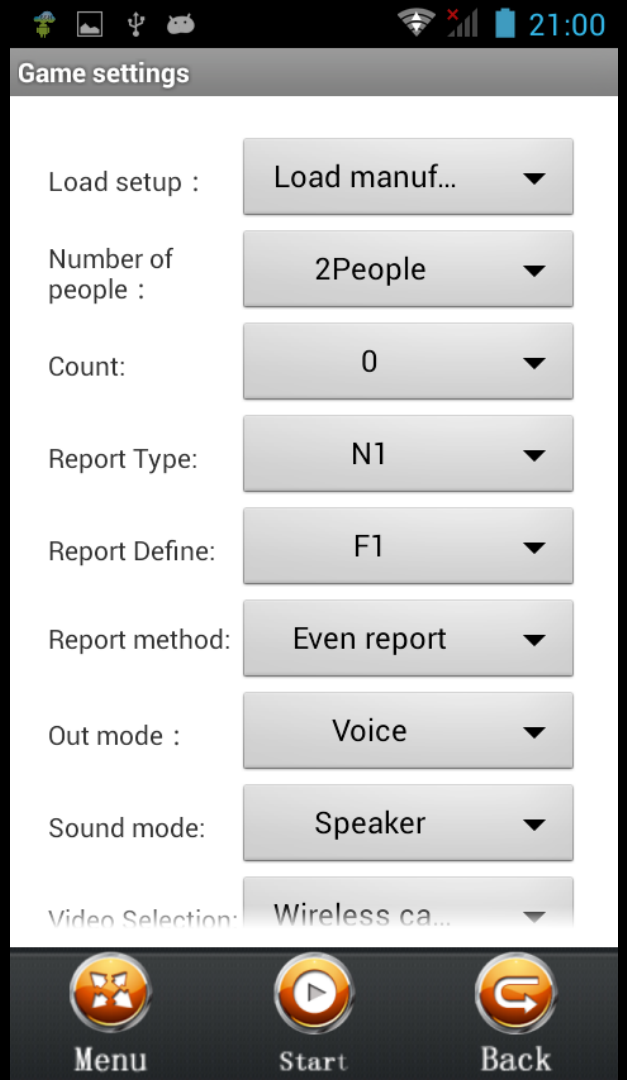
21:00
Game settings
Load setup：
Load manuf...
Number of people：
2People
Count:
0
Report Type:
N1
Report Define:
F1
Report method:
Even report
Out mode：
Voice
Sound mode:
Speaker
Video Selection:
Wireless ca...
Menu
Start
Back

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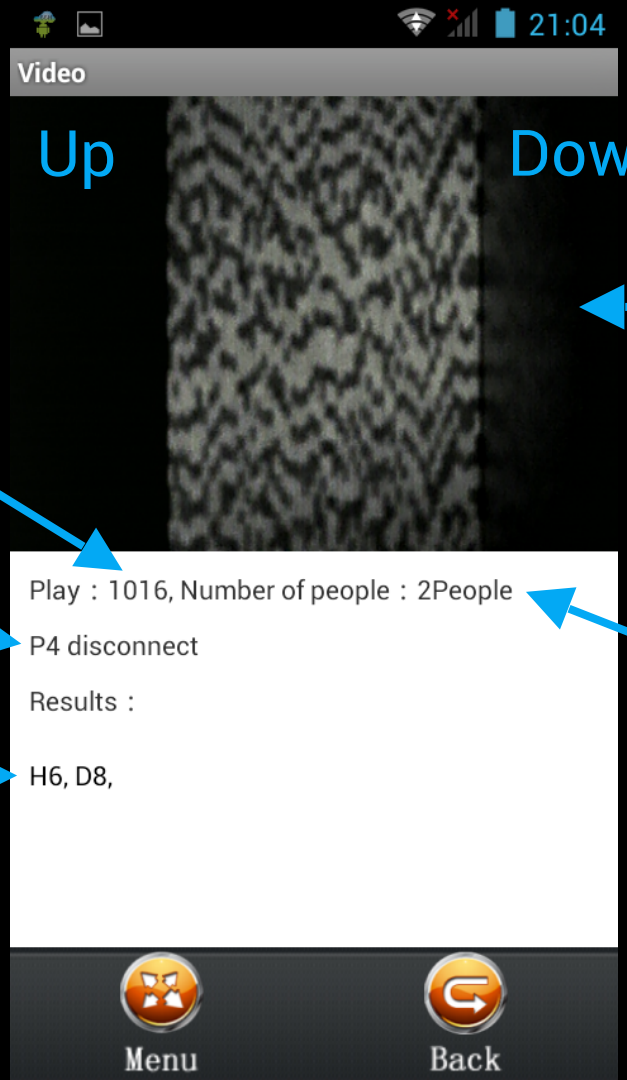


Game type in use

Feedback device

Result

Cards as seen by camera face down

Number of players

Fun facts

App(s) not obfuscated

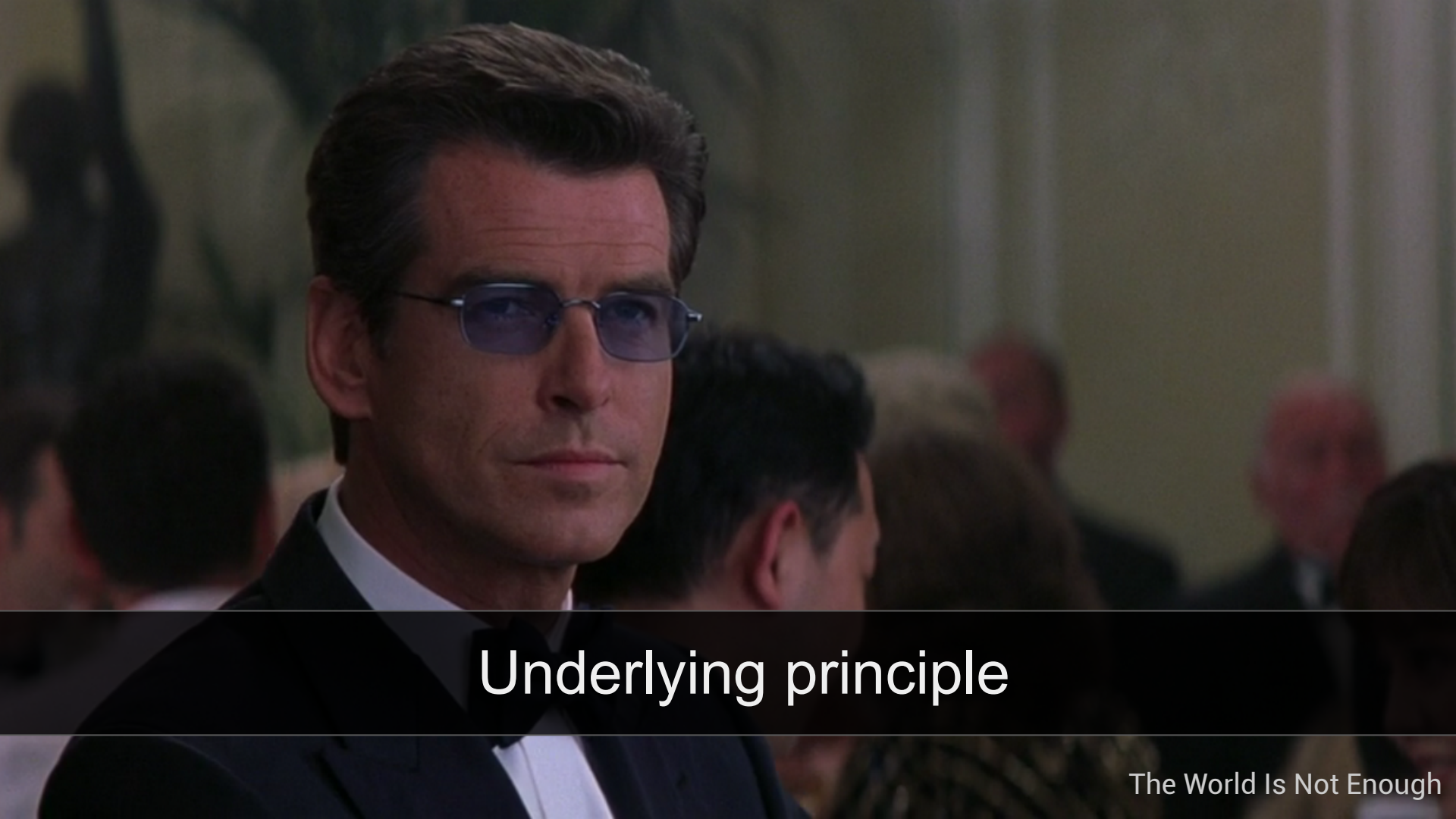
Easy to read as 123 if you know Java :)

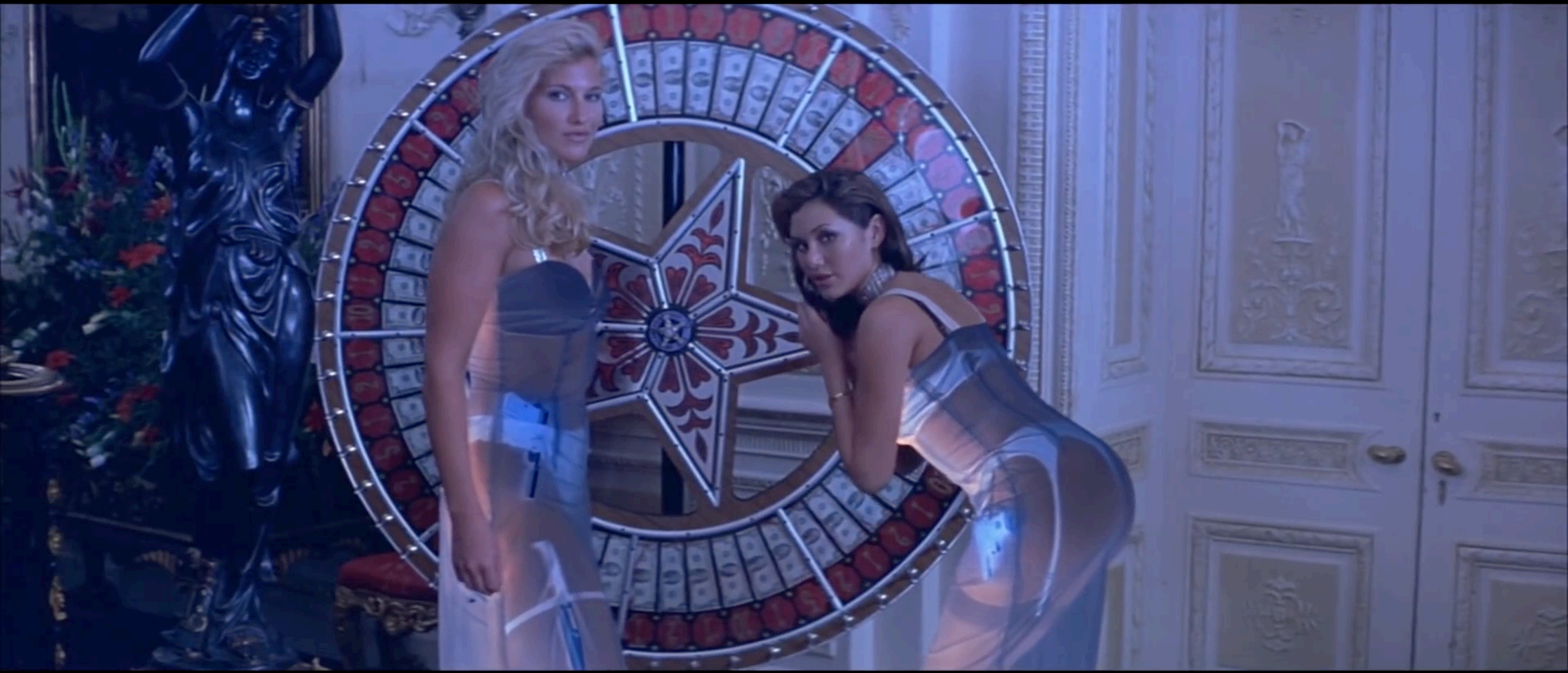
Super user password hard coded in string file...

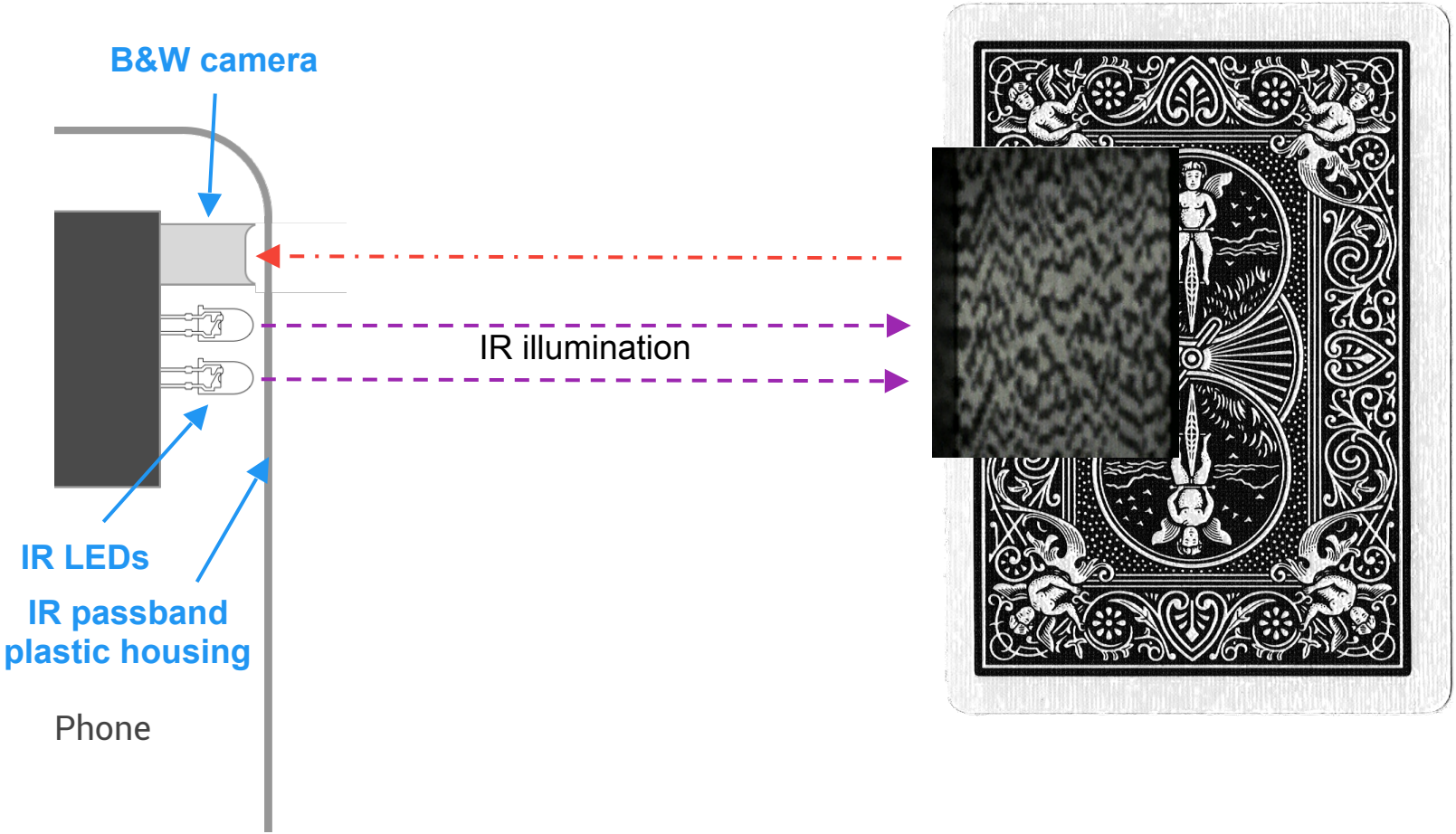
The app has a super user password that allows access on any devices

Most of the interesting features are in a kernel module

Remote devices control and cards recognition handled by a kernel module


Underlying principle
The World Is Not Enough




B&W camera
IR illumination
IR LEDs
IR passband
plastic housing
Phone







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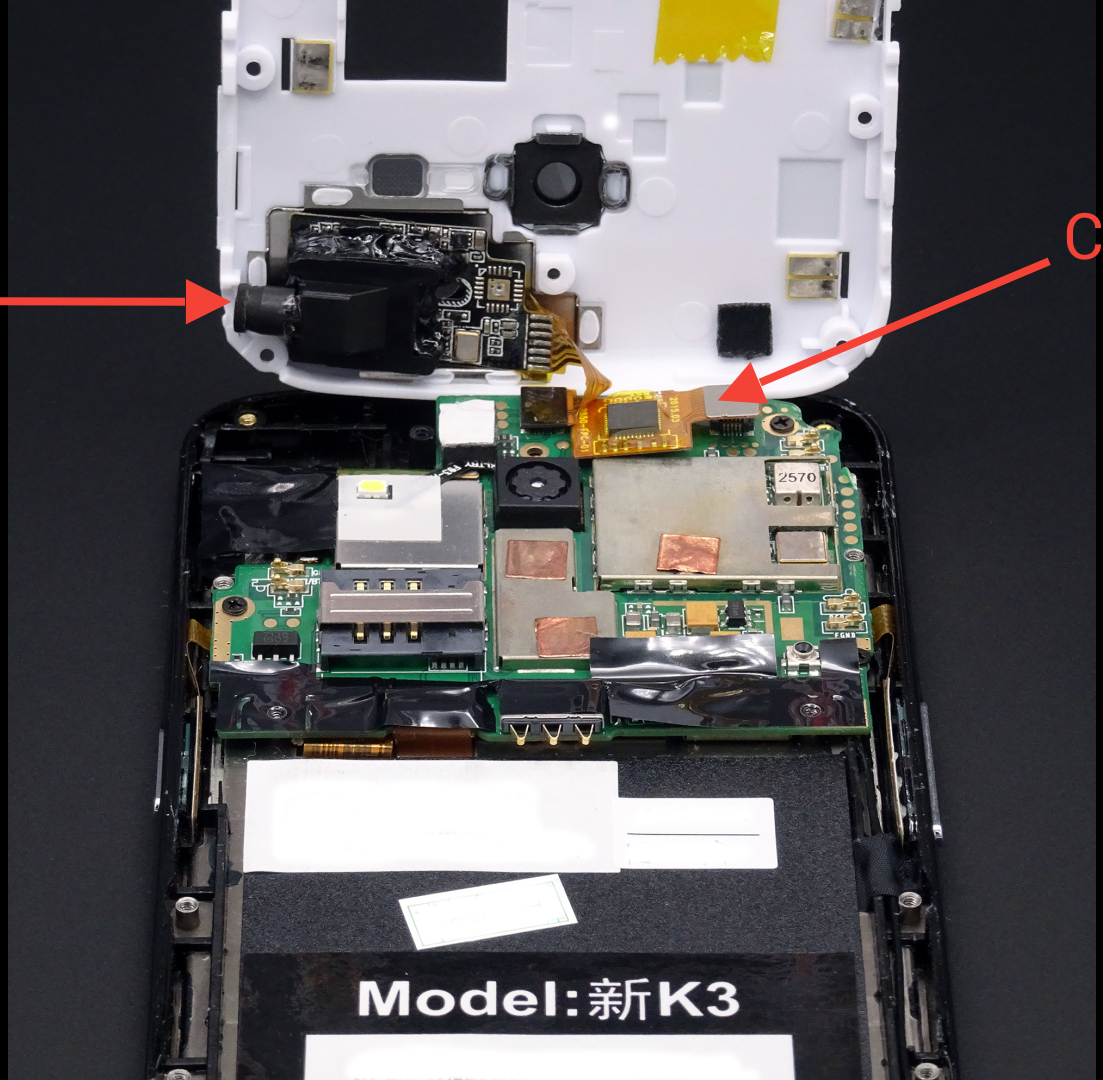

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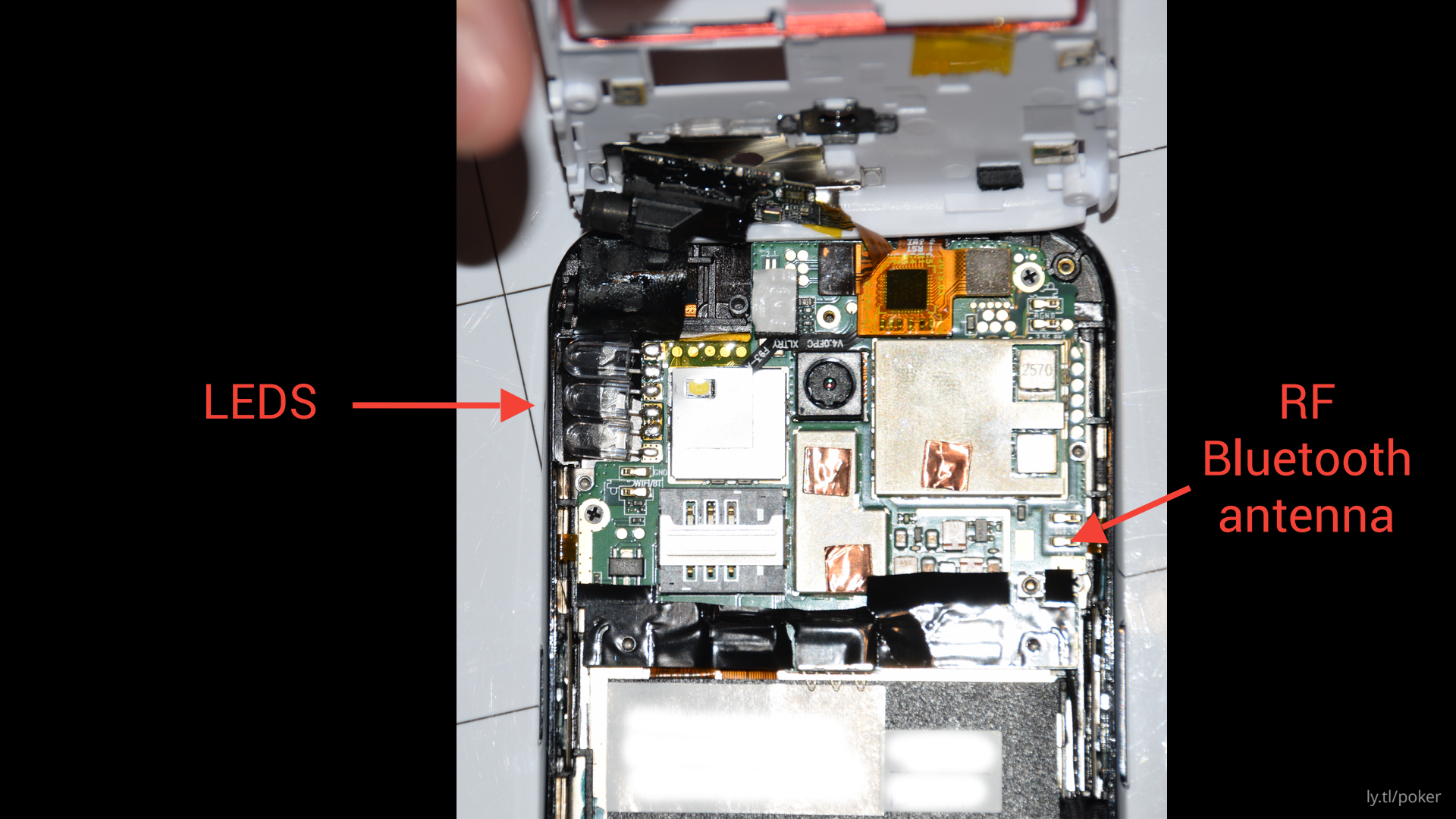
LEDS
RF
Bluetooth
antenna



Cards marking

Casino Royale

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THE
U. S. PLAYING
CARD COMPANY
BICYCLE
BICYCLE
TRUSTED SINCE 1885
EVERY TIME YOU OPEN A FRESH DECK OF BICYCLE® PLAYING CARDS, YOU ARE HANDLING 125 YEARS OF EXPERTISE. WE PROUDLY CRAFT EACH DECK USING CUSTOM PAPER AND COATINGS, SO YOU CAN TRUST BICYCLE PERFORMANCE HAND AFTER HAND.
STANDARD SIZE STANDARD FACE
COME TO PLAY™ BICYCLECARDS.COM

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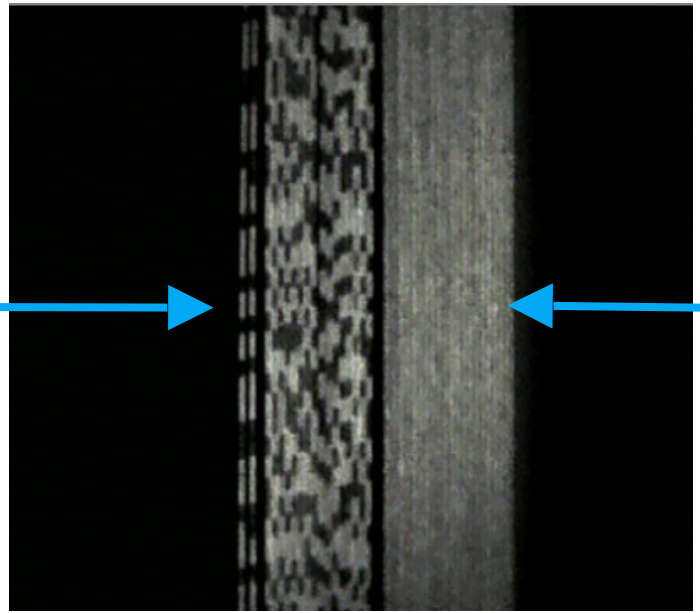
Marked cards vs regular cards



Device camera view

Card encoding

6 H

6 C

6 D

5 D

5 H



```
public static String GetSpeakCardStr(int number) {
        String str = "";
        int type = number / 1000;
        int idx = number % 1000;
        int sType = idx / 100;
        int sidx = idx % 100;
        if (type == m_SpeakNoneType) {
            if (sType >= 1 && sType <= 4) {
                str = (str + GetCardTypeStrEn(sType)) + GetCardNameStr(sidx);
            } else if (sType == 5) {
                str = str + GetCardNameStr(sidx);
            }
            return str;
        } else if (type == m_SpeakCardType) {
            return "" + idx;
        } else {
            if (type == m_SpecialCardType) {
                return str;
            }
            if (IsSpecialSound(number)) {
                return str + GetSpecialSoundText(number);
            }
            if (type >= 1 && type <= 6) {
                str = str + GetCardTypeStrEn(type);
            }
            if (idx >= 0 && idx <= 19) {
                str = str + GetCardNameStr(idx);
            }
            return str;
        }
    }
```

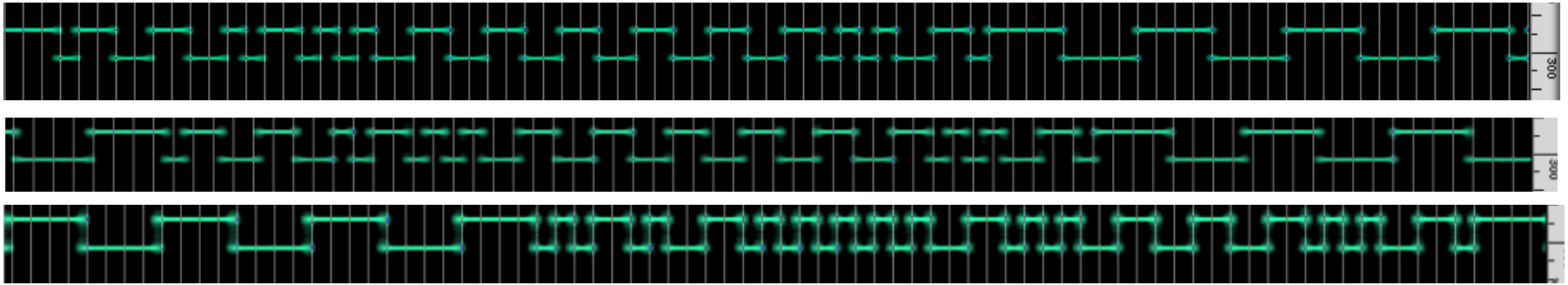


Feedback devices

Quantum of Solace

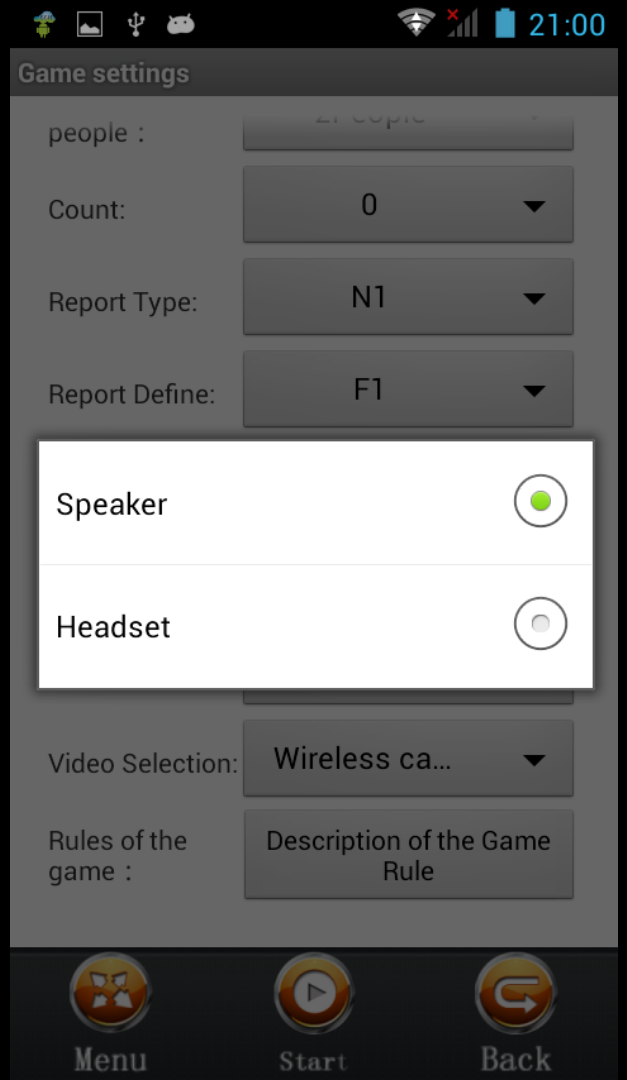

Number of players
AKK
Sound on/off

Intercepting radio-command



2-FSK modulation

Center frequency: 868.289 MHz
Data rate: 2400bps
Measured Δf =19kHz


21:00
Game settings
people :
Count:
0
Report Type:
N1
Report Define:
F1
Speaker
Headset
Video Selection:
Wireless ca...
Rules of the game :
Description of the Game Rule
Menu
Start
Back

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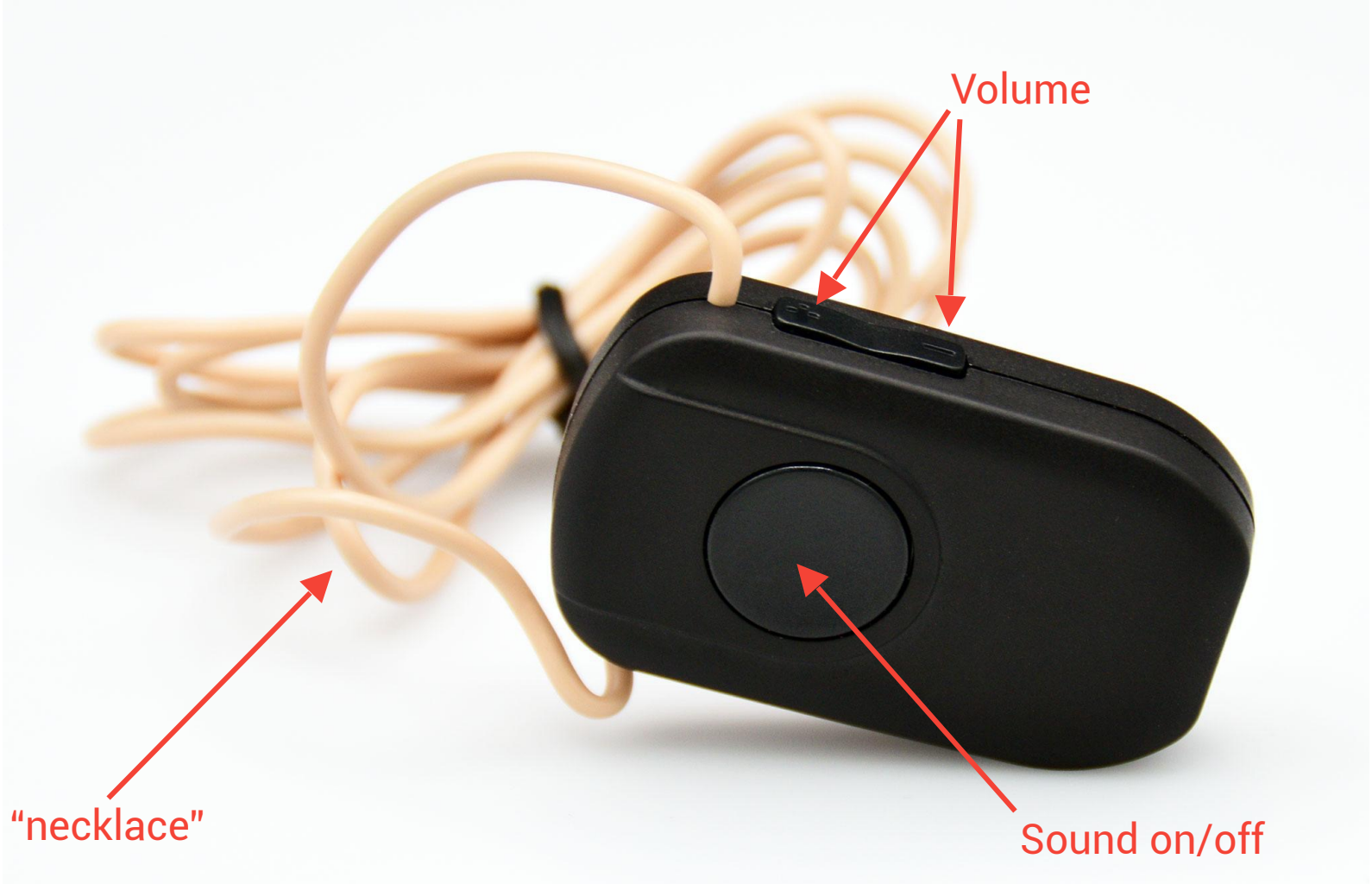
Volume
“necklace”
Sound on/off



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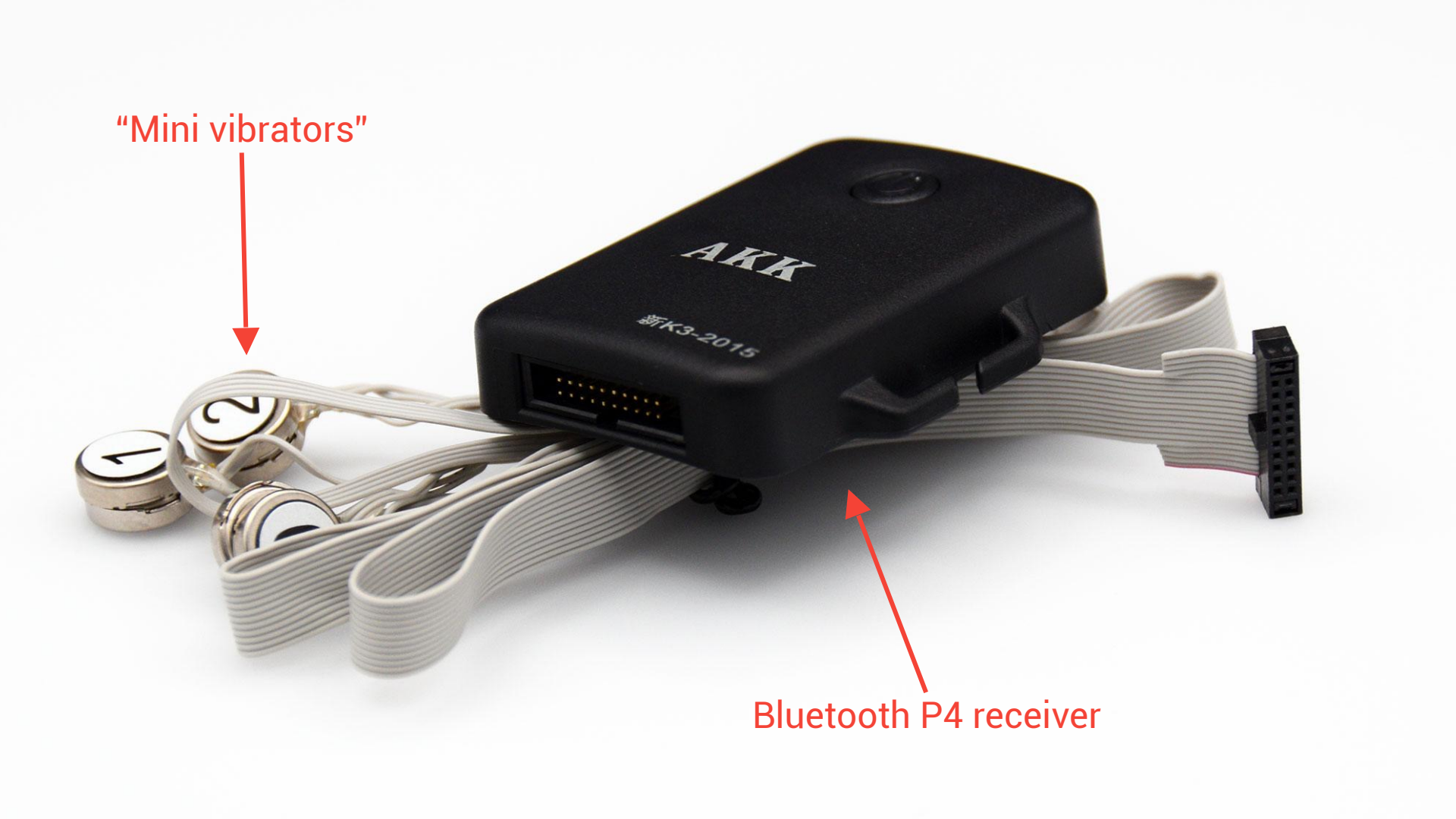
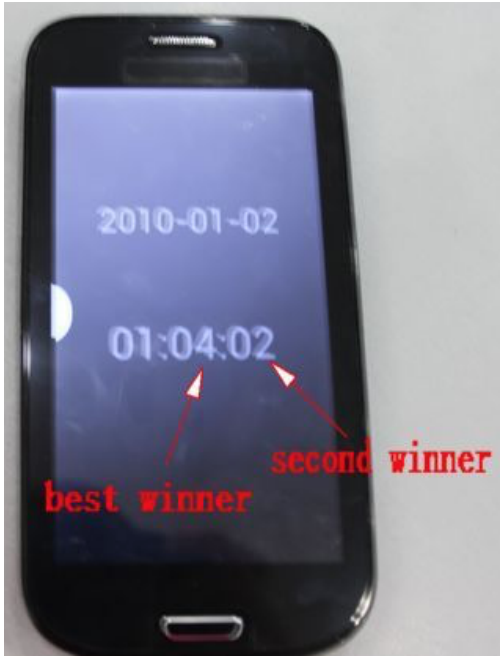
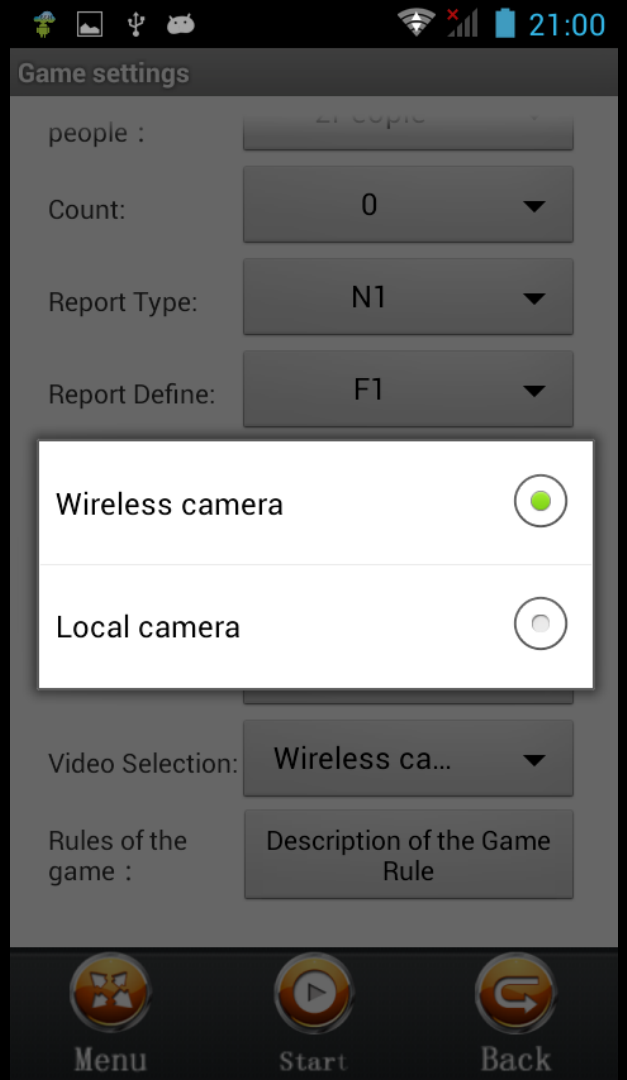

“Mini vibrators”
AKK
新K3-2015
Bluetooth P4 receiver

Sneaky time display





Wireless camera


21:00
Game settings
people :
Count:
0
Report Type:
N1
Report Define:
F1
Wireless camera
Local camera
Video Selection:
Wireless ca...
Rules of the game :
Description of the Game Rule
Menu
Start
Back

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PK王

专业镜头

钥匙遥控器

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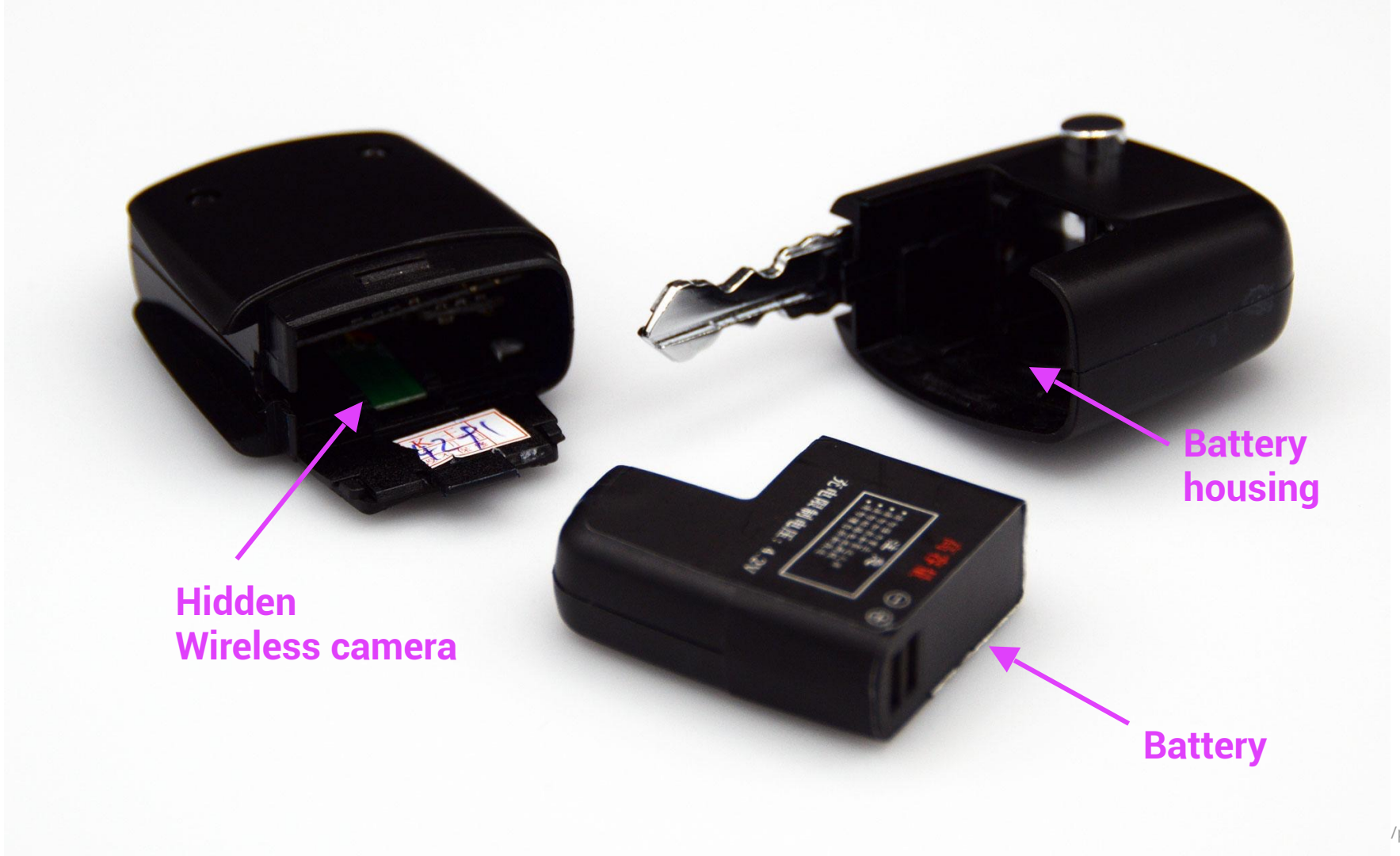
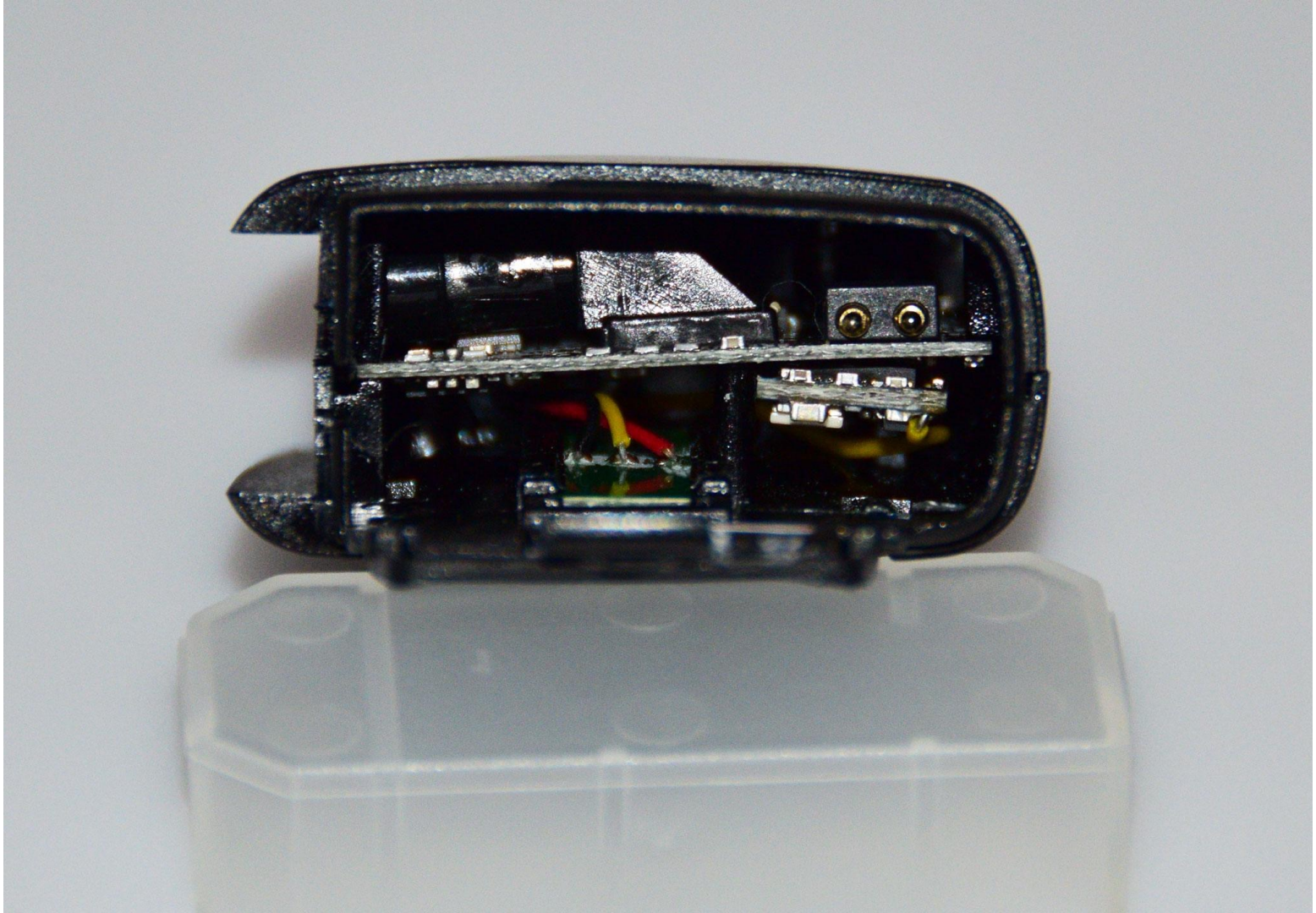


/poker



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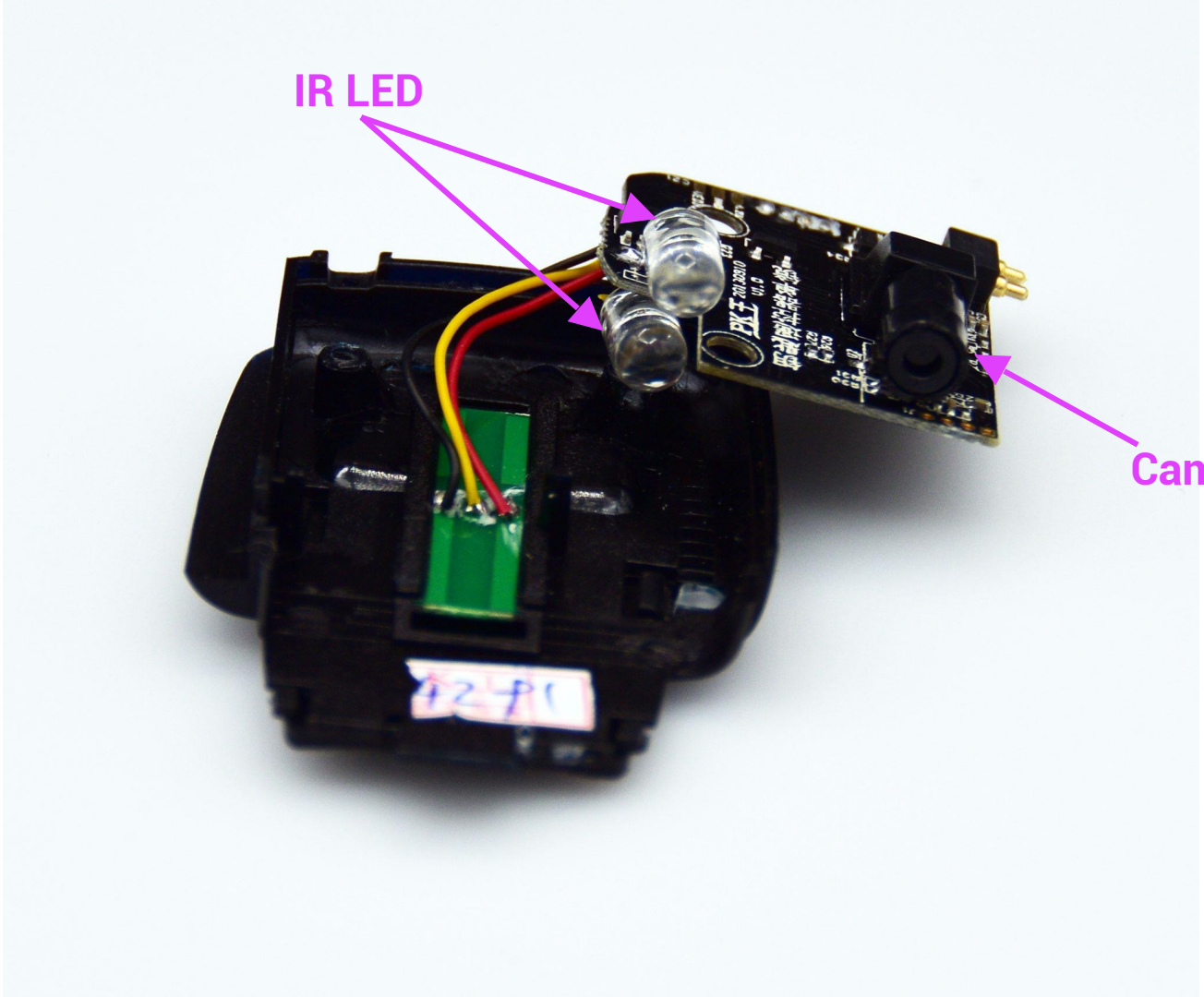
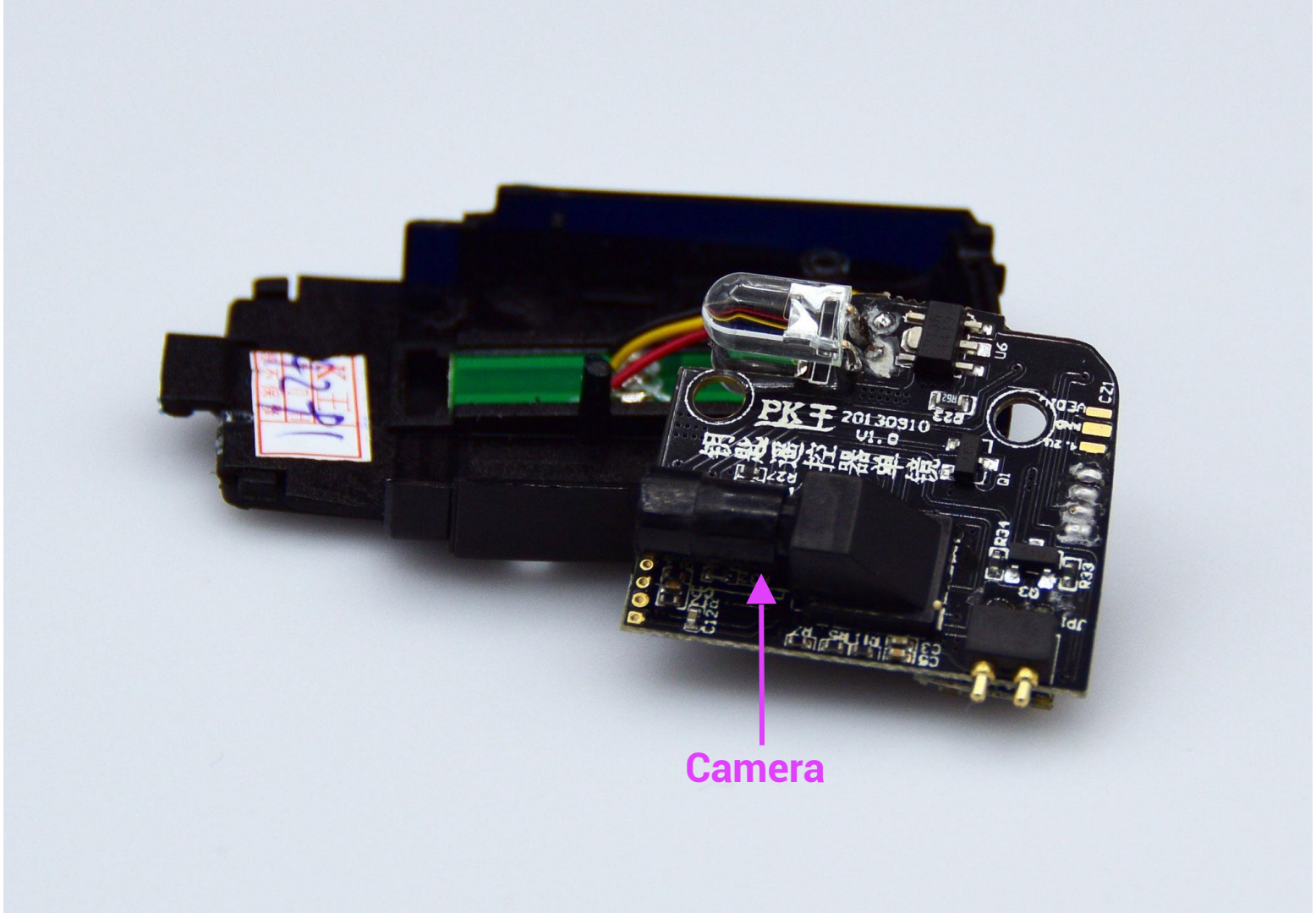
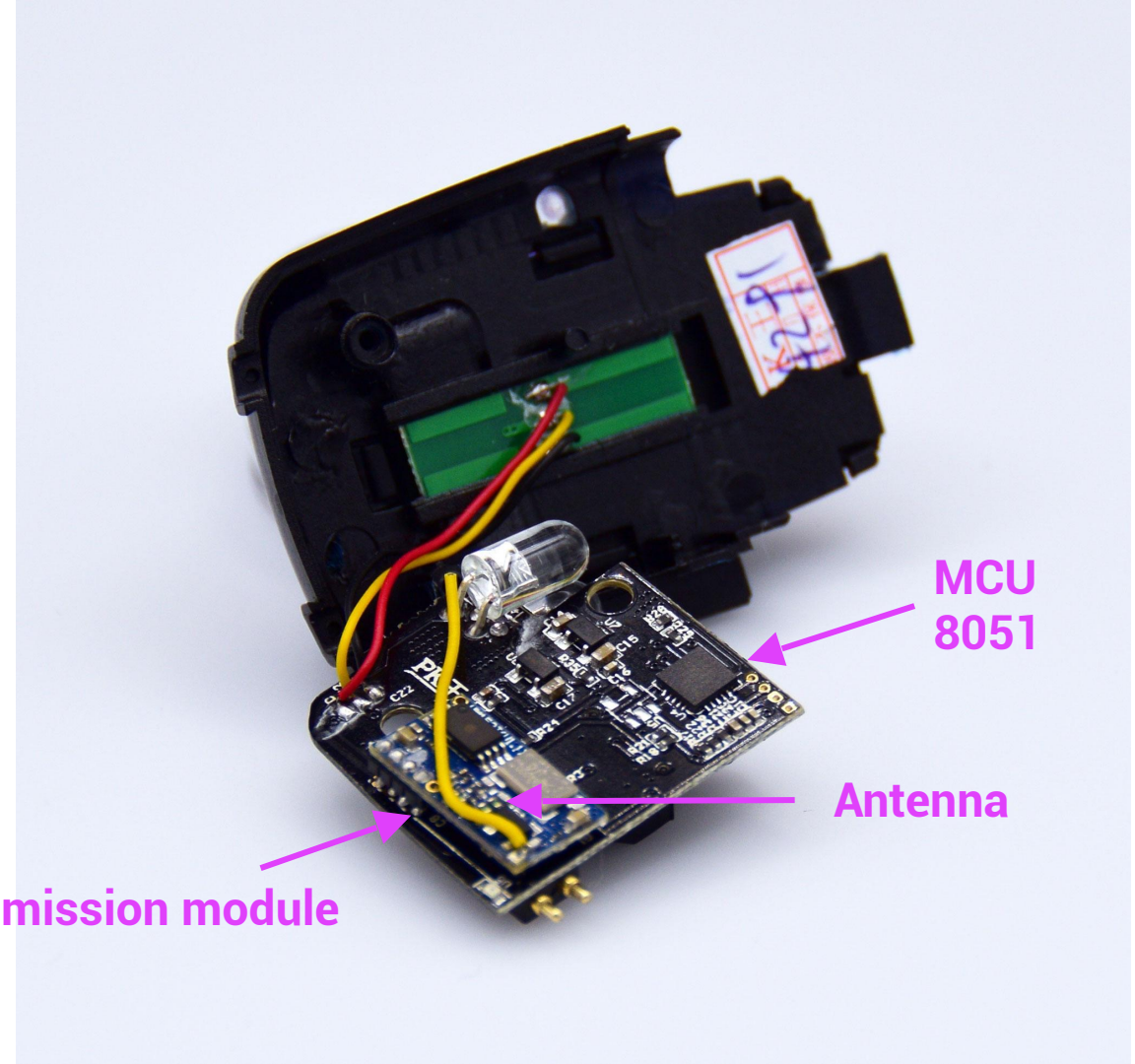

IR LED
Camera

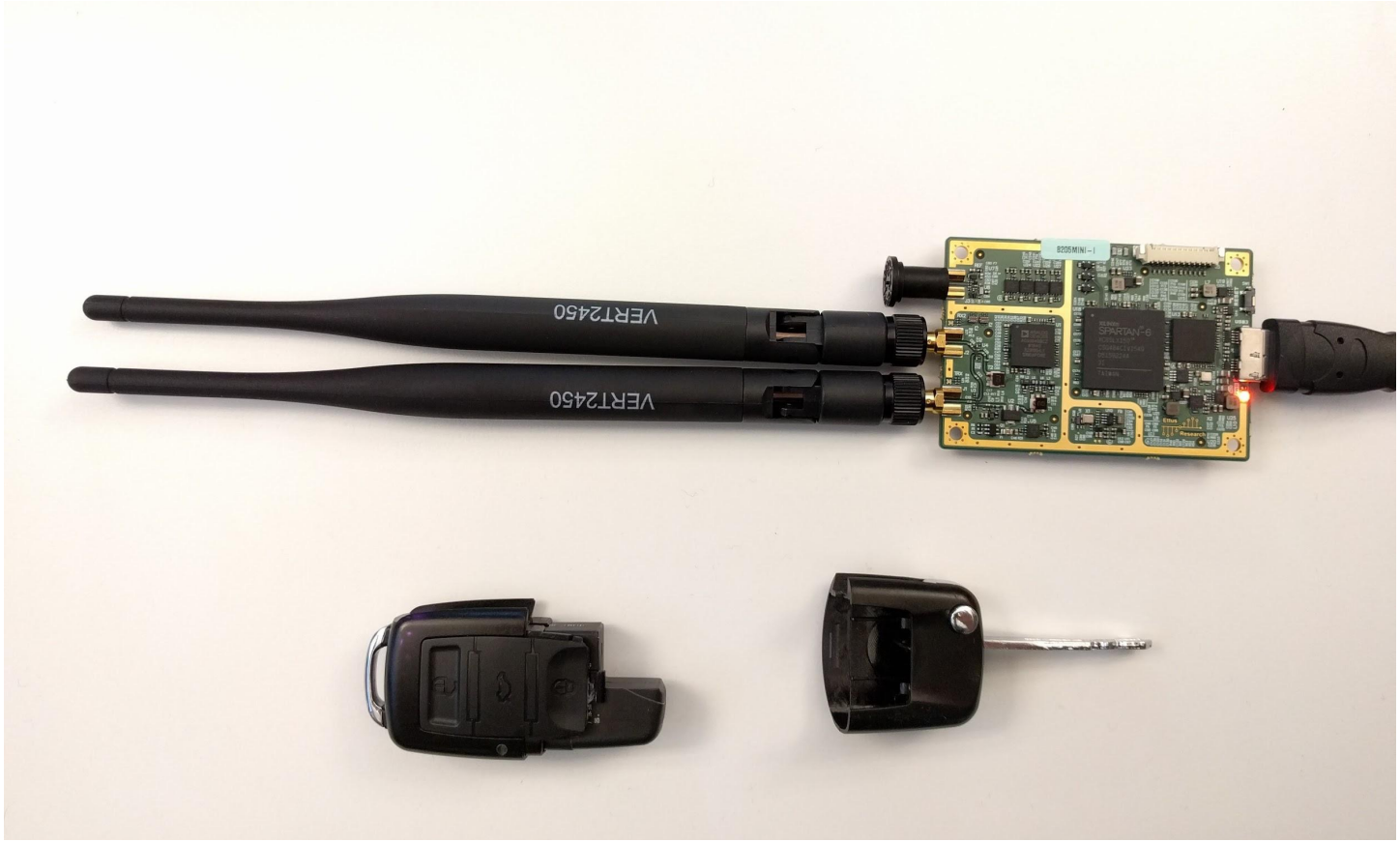

PK王
20130910
V1.0
Camera


MCU
8051
Antenna
Transmission module

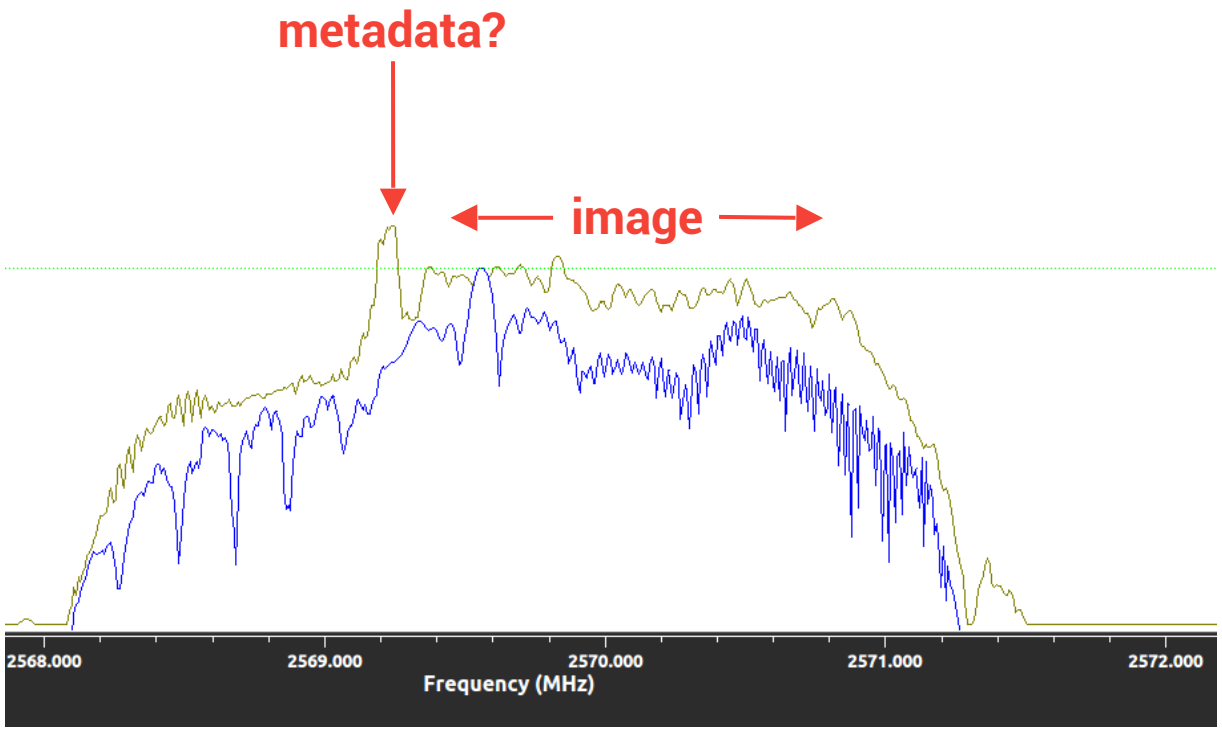
Transmission module VM152T



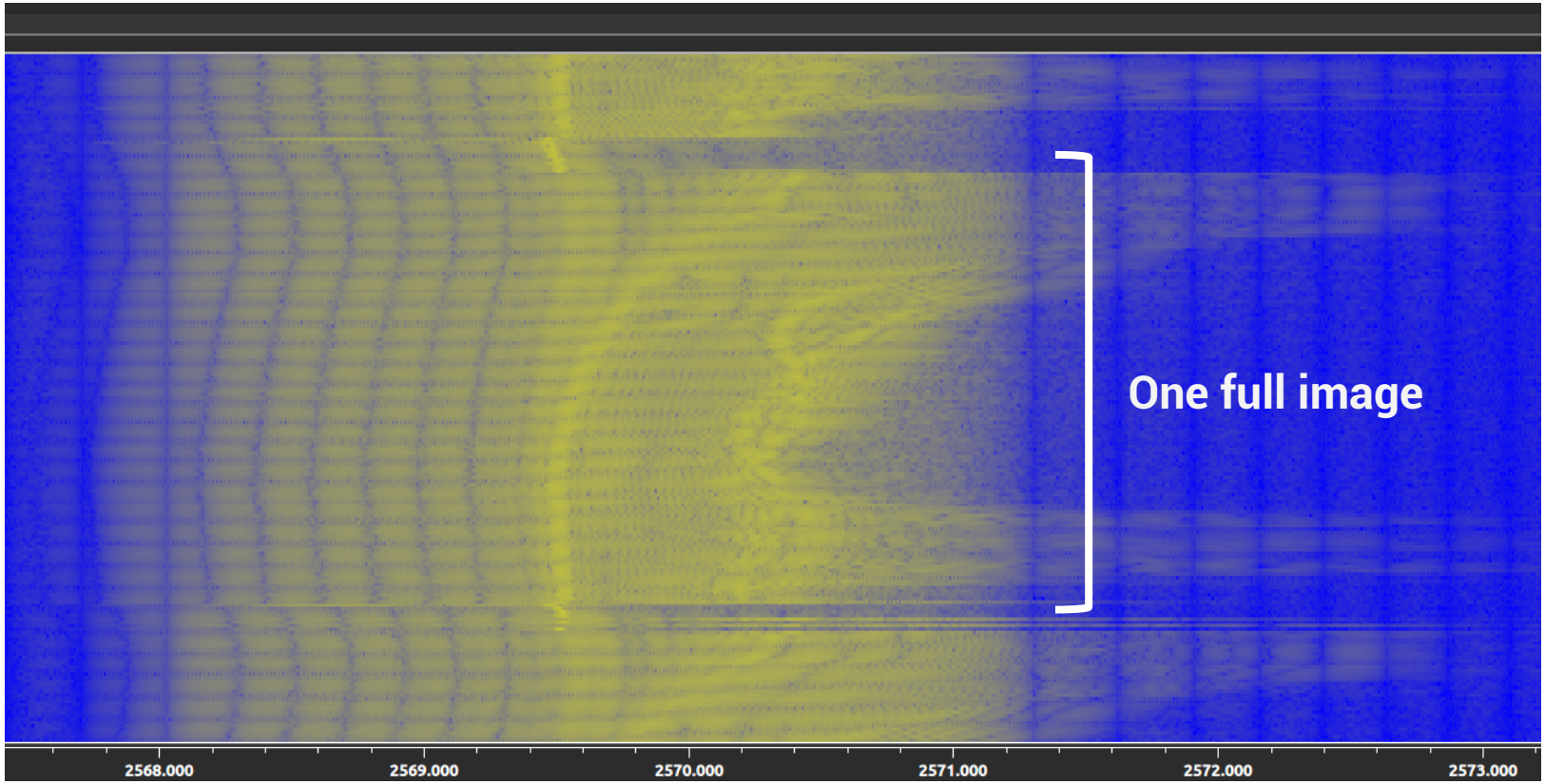
传输频道频率（transmission frequency group）：
CH1:2370MHz CH2:2570MHz
1.3 调制类型（Modulation type）： FM
2 结构规格书（Mechanical Specification）
VM152T Please refer to Figure 1.
3 环境条件（Environmental Specification）
3.1 工作温度（Temperature ）-10℃ ~ +60℃
4 测试条件（Test Condition）
4.1 周边环境温度（Ambient temperature）：25℃
4.2 视频输入电压（Video input voltage）：1.0Vp-p,150 (IRE)
电源电压（Supply Voltage） 3.3 5V 5.5 VDC
2 电流(Current Consumption) 95 105 mA
5.2 视频特性（Video Characteristics）
1 输入阻抗（Input Impedance） 75 Ω
2 峰值频偏（Peak Deviation） 1.2 MHz
调制源(MOD):
正弦波(sine wave)
400KHz 1Vp-p
5.4 RF输出特性（Output Characteristic ）
1 发射功率(Tx Power) 16 17 18 dBm
CH1：2.370GHz 0 1
CH2：2.468GHz 1 0
CH3：2570GHz 1 1
CH4：2670GHz 0 0
体积 15*8.3


VERT2450
VERT2450
SPARTAN-6

Transmission analysis



Transmission analysis





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Open questions

Who created such device? Casinos?

Level of sophistication means either stolen tech or large underground market

Who is ripping who?

Where is this thing actively used? Need detection means and field study!

Where is the ink is coming from?

You can't buy it easily - only for secure marking of docs

Takeway

James Bond devices exist!

They are hard to find but reality match fiction

Crimeware can be super sophisticated

While NSA have cool tools, the crime mob does too!

A very diverse skillset is required to tackle this type of device

infiltration, hardware analysis, software analysis, RF analysis, Vision Alg.

Co-conspirators



Pixel: Hardware specialist

Vivi: Chinese blackmarket infiltration expert


Thanks!