

# CHEATING AT POKER JAMES BOND STYLE

Elie & Celine Bursztein Jean Michel Picod





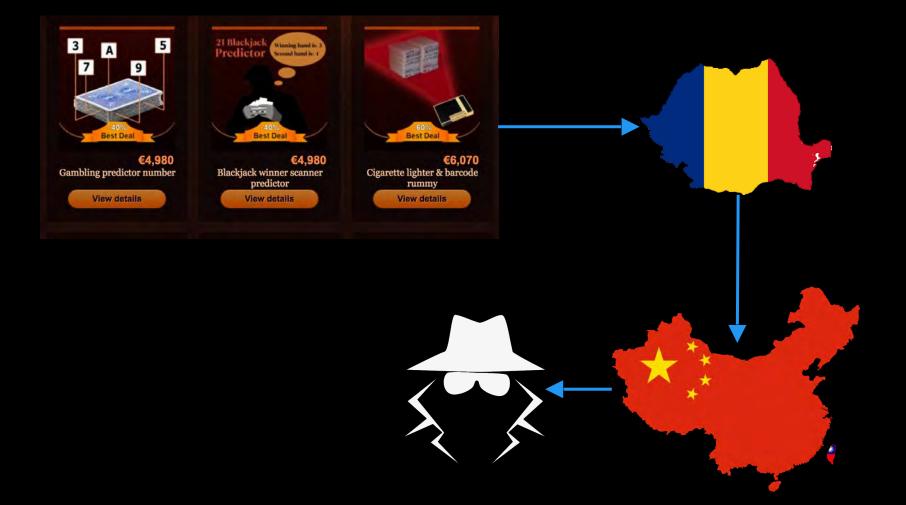












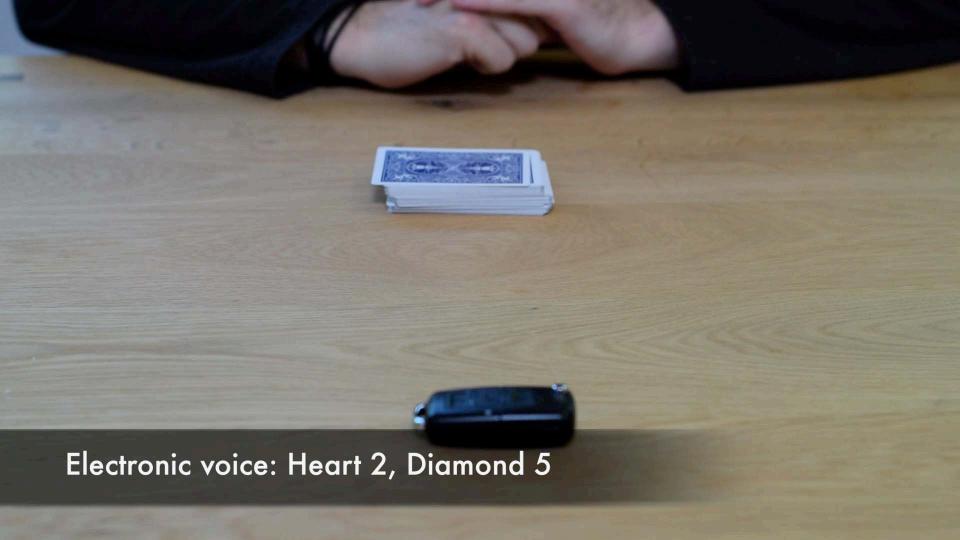


















# Visible differences



**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

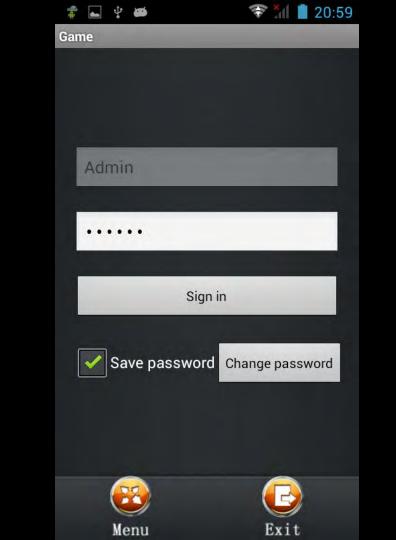
Backdoor? No need for network or SIM

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

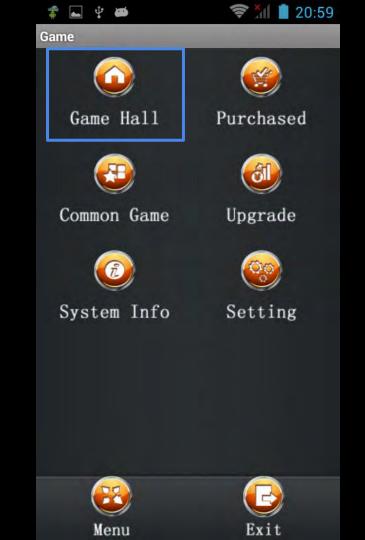












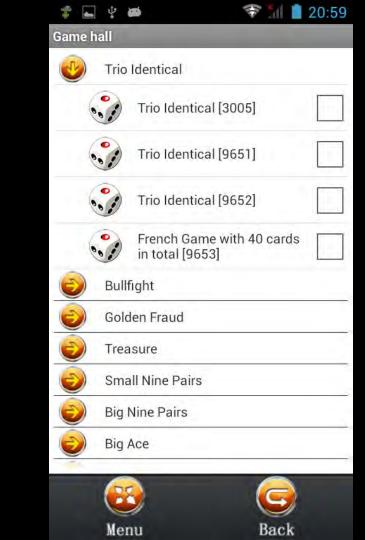








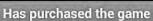






1. 7-card Texas Hold'em poker

2. Read the card directly [1016]





Back

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

Menu

[7003]





21:00

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

Has purchased the game

[7003]

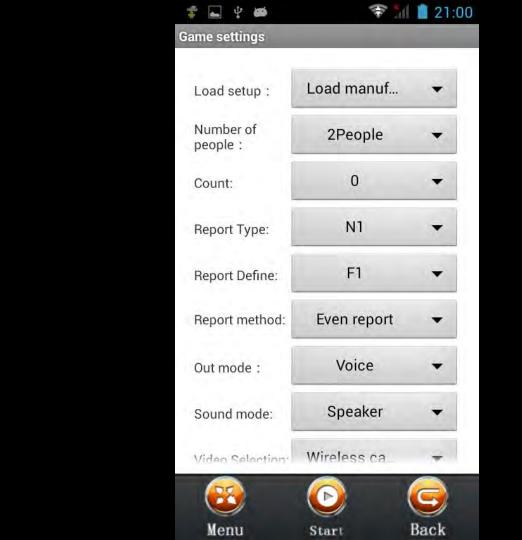


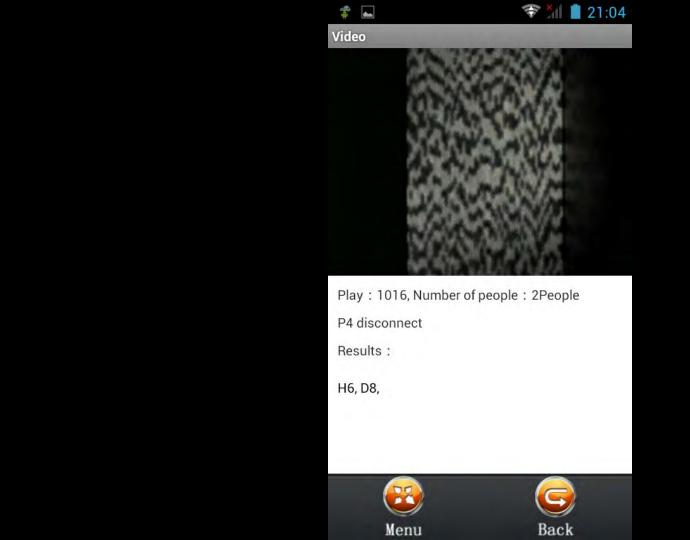
Menu

Back

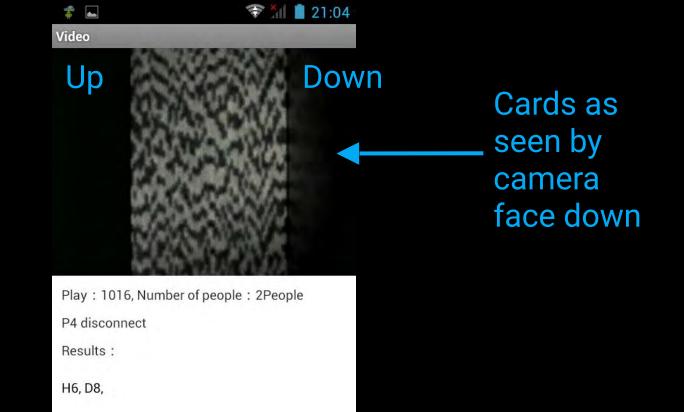
1. 7-card Texas Hold'em poker

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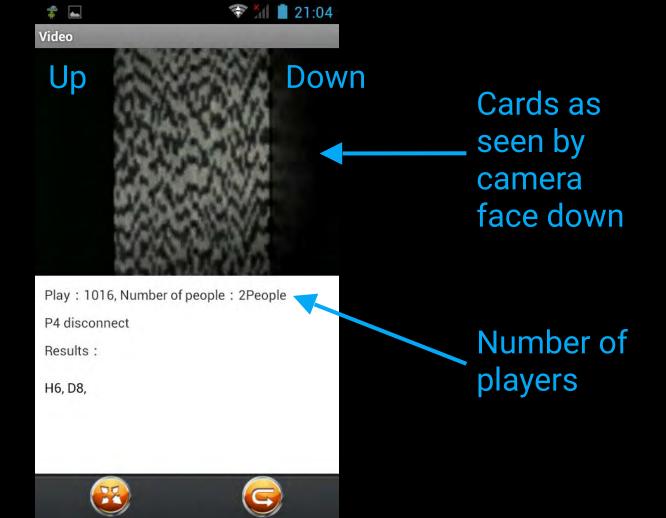




ly.tl/poker

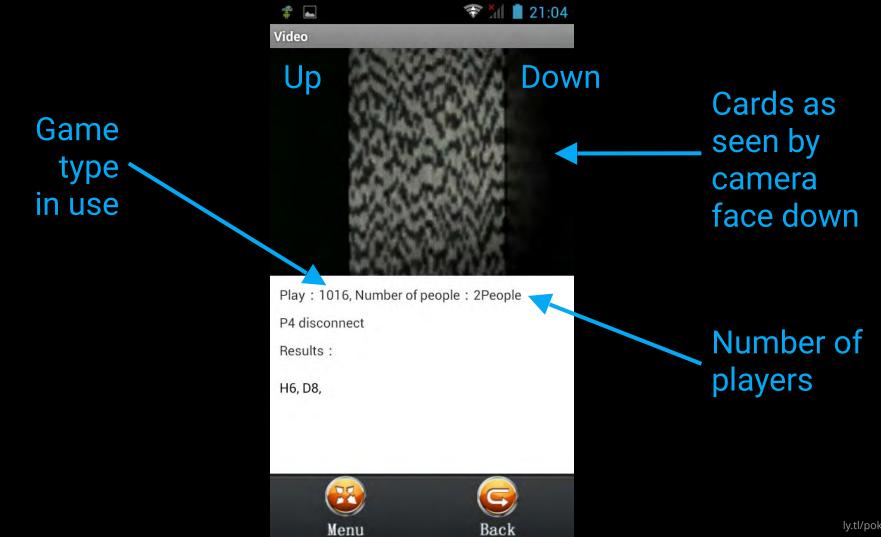


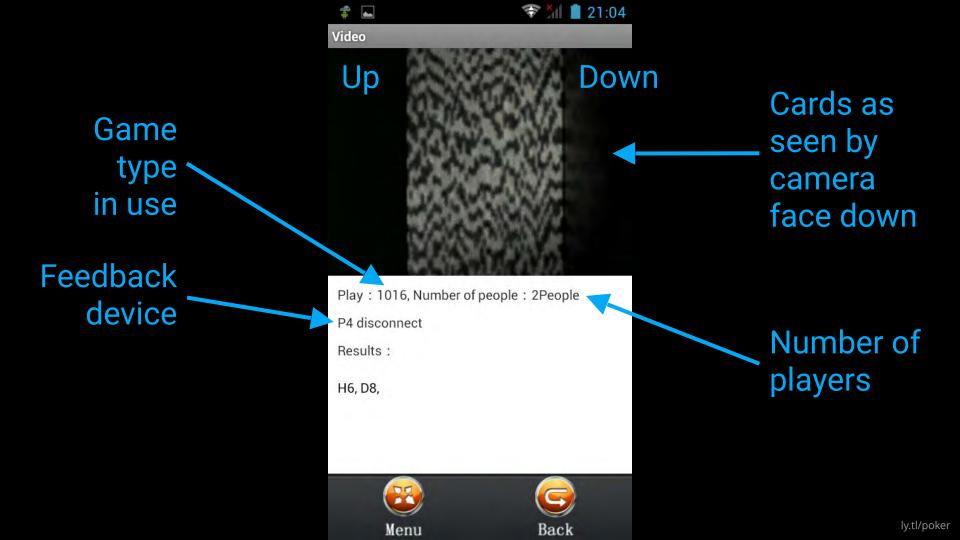


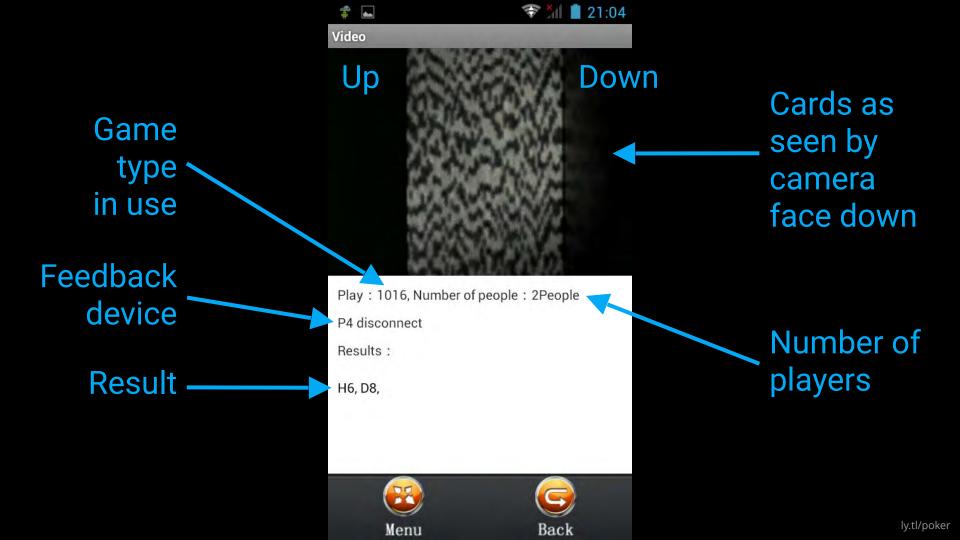


Back

Menu







#### Fun facts

App(s) not obfuscated

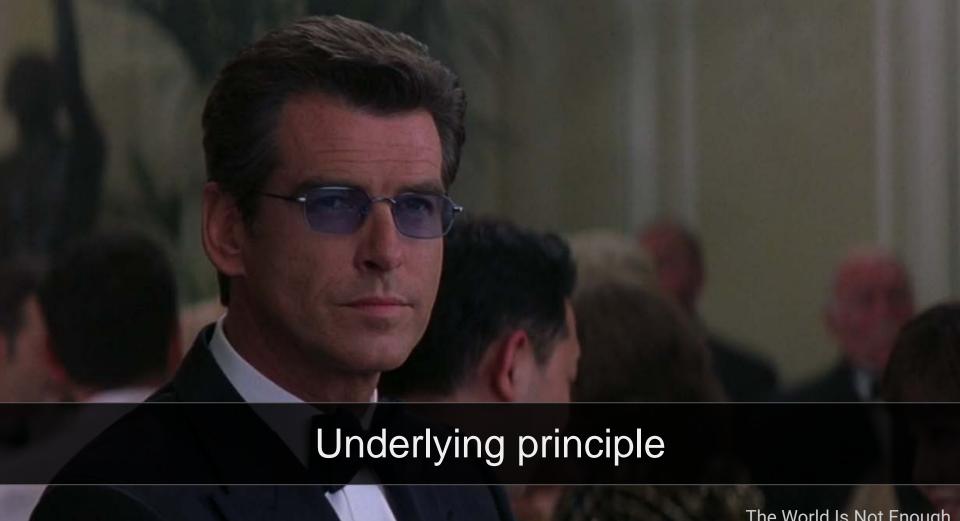
Easy to read as 123 if you know Java:)

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

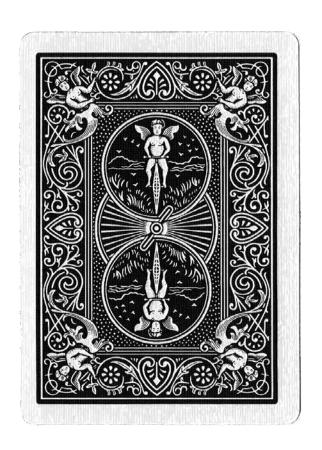
Remote devices control and cards recognition handled by a kernel module

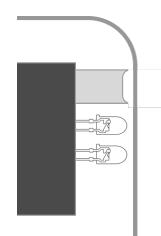


The World Is Not Enough

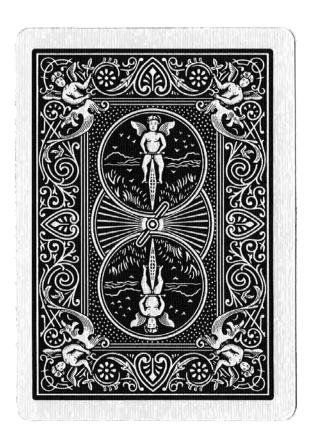


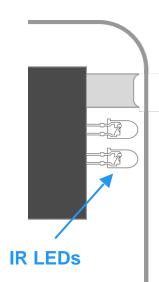




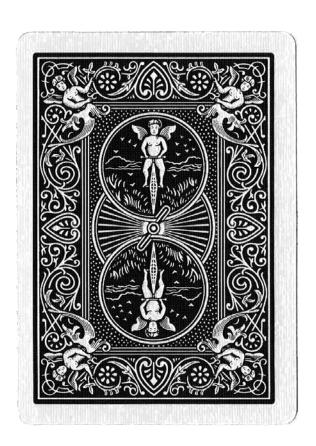


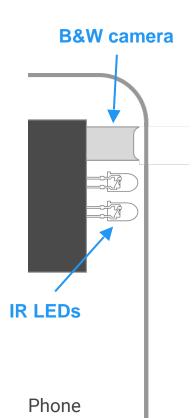
Phone

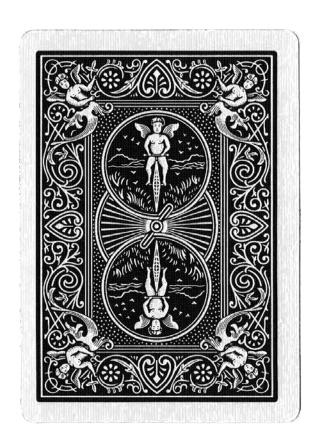


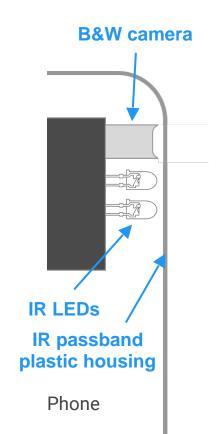


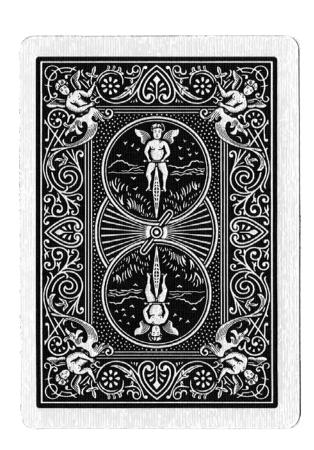
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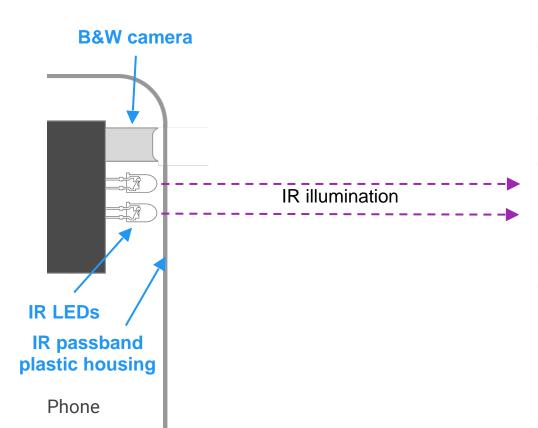


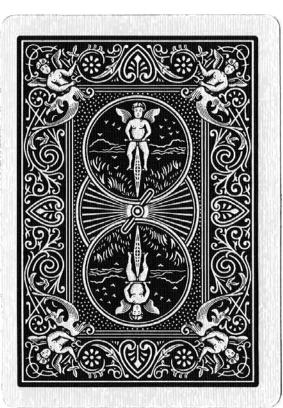


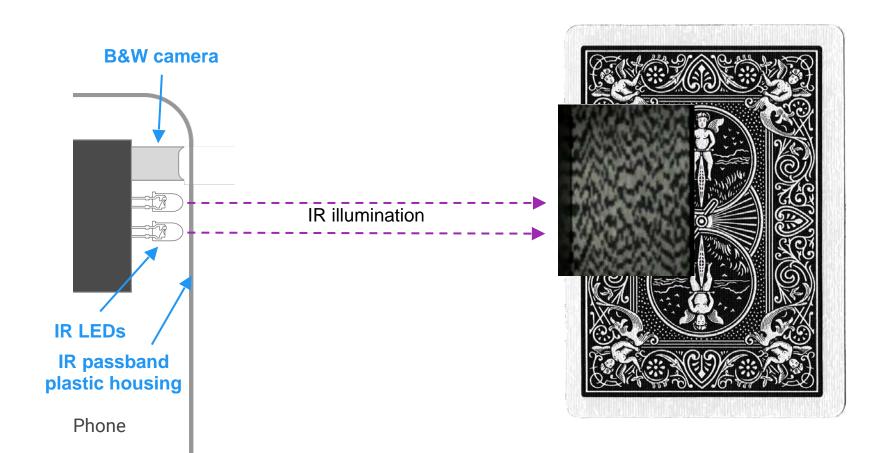


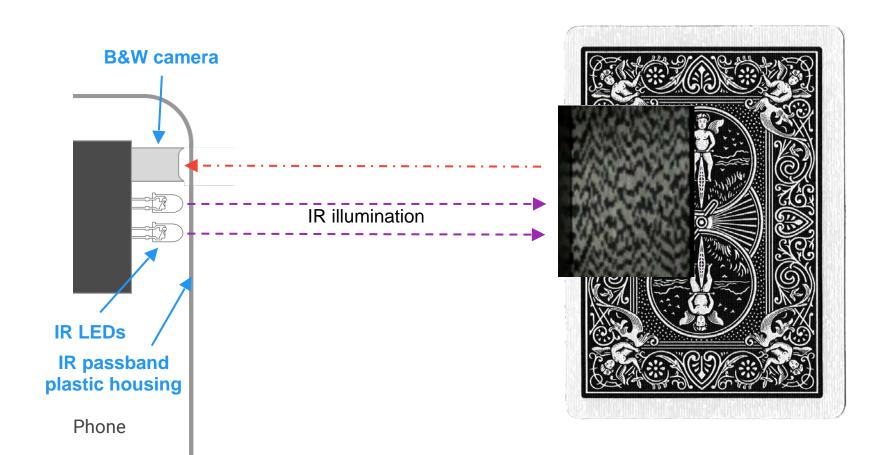








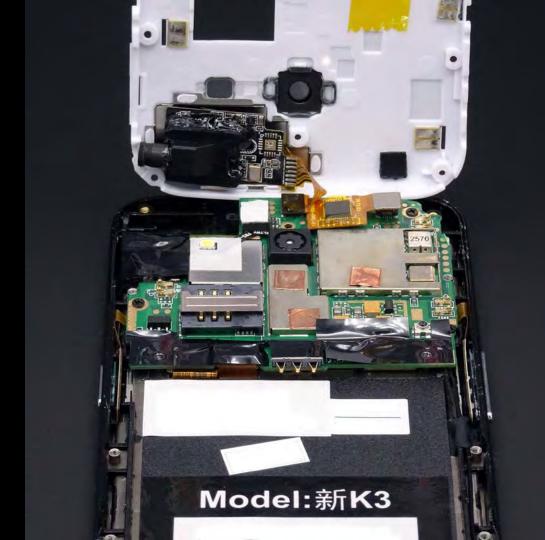


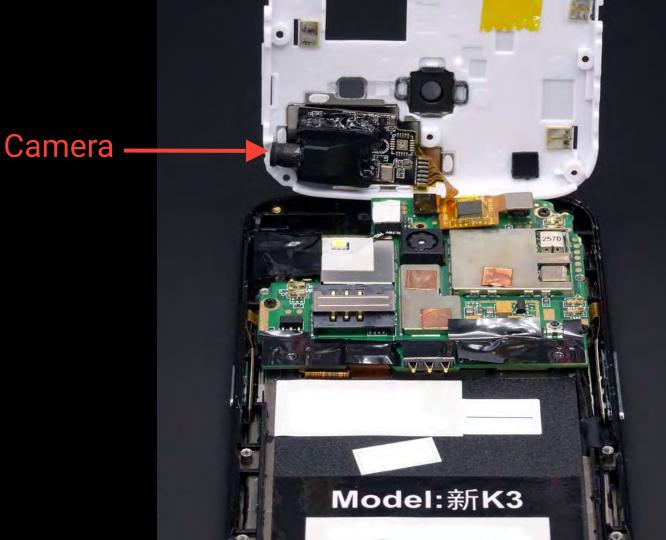


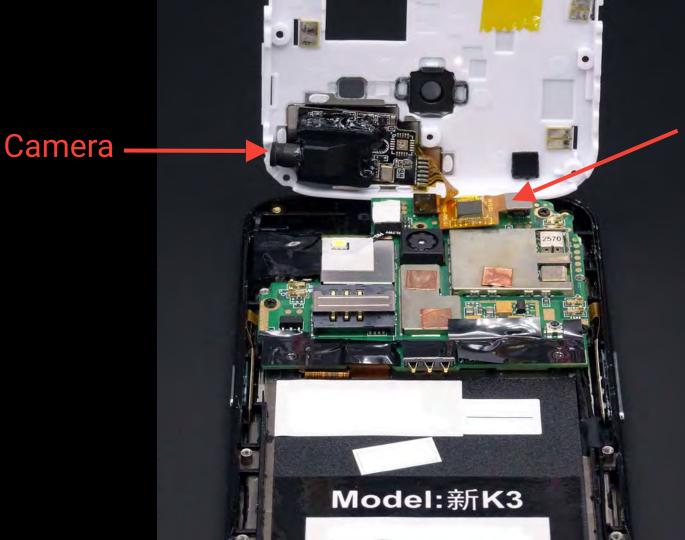




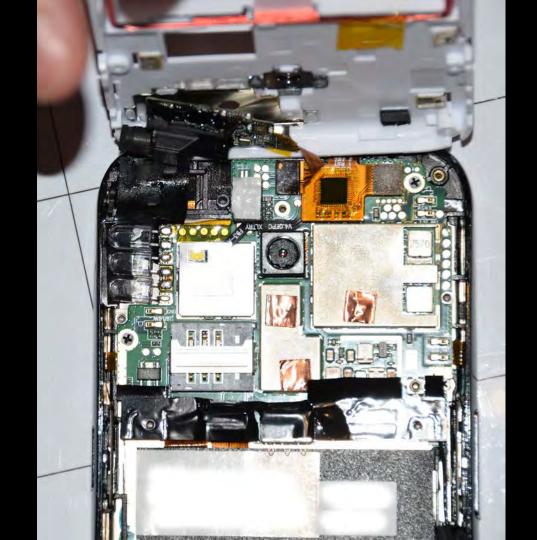


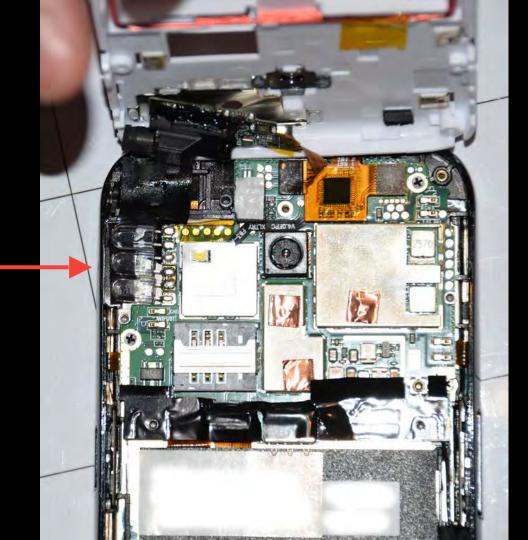




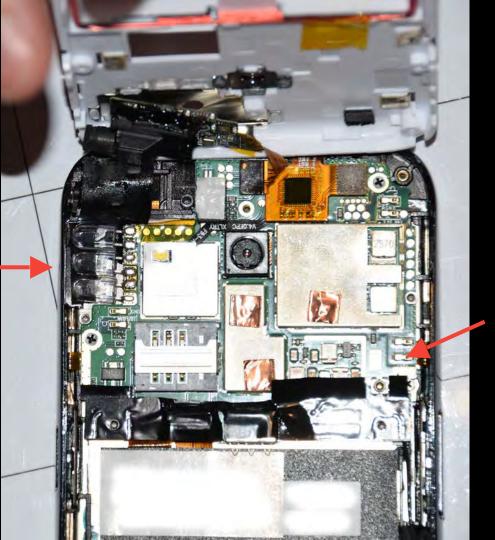


Custom chip





LEDS



**LEDS** 

RF Bluetooth antenna



# Cards marking

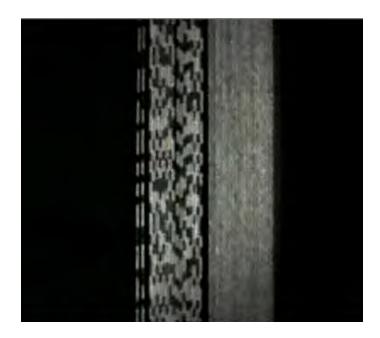






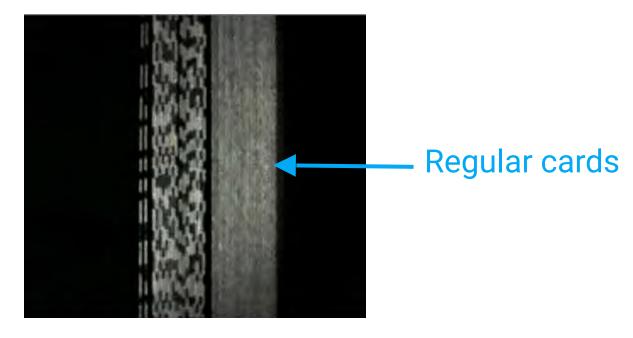


## Marked cards vs regular cards



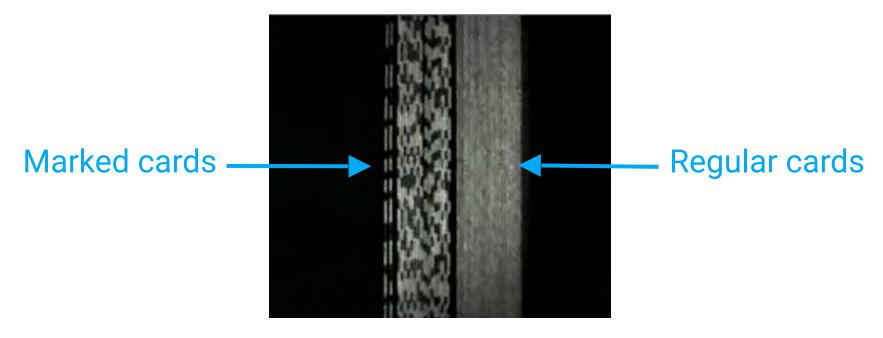
Device camera view

## Marked cards vs regular cards



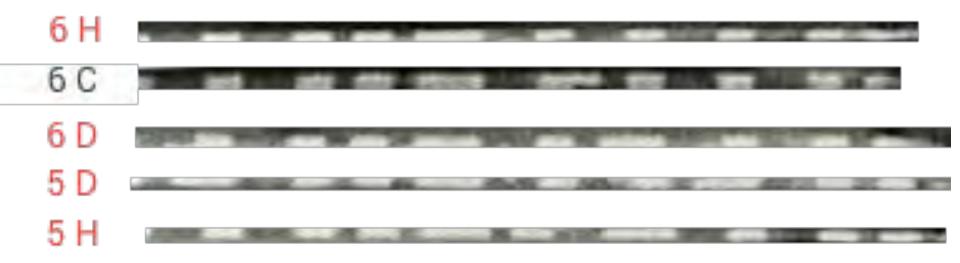
Device camera view

#### Marked cards vs regular cards

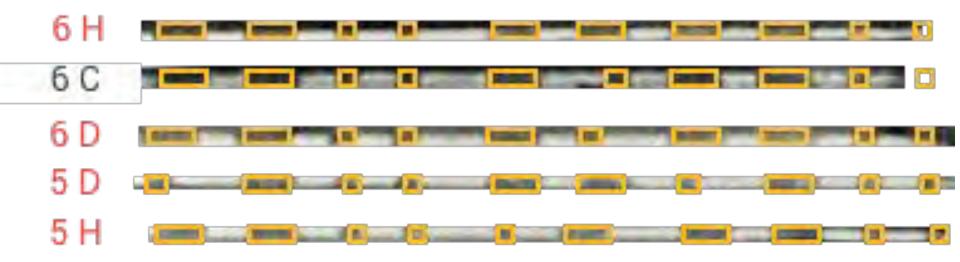


Device camera view

## Card encoding

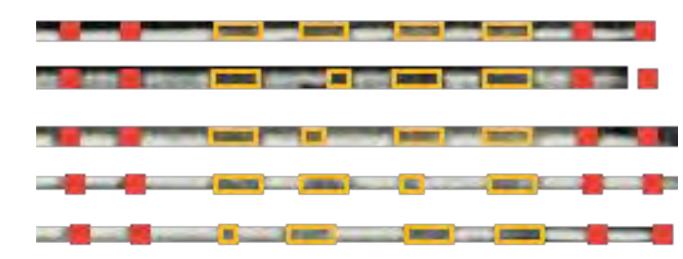


#### Card encoding



## 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);
           1f (idx >= 0 66 idx <= 19) {
               str = str * GetCardNameStr(idx);
           return str;
```



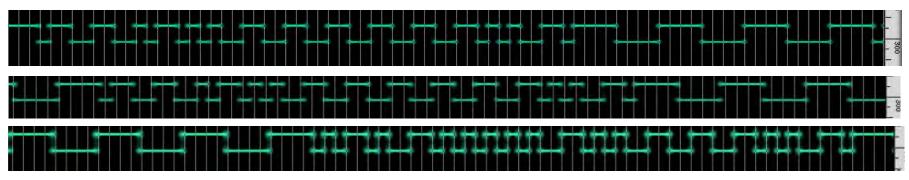
# Feedback devices







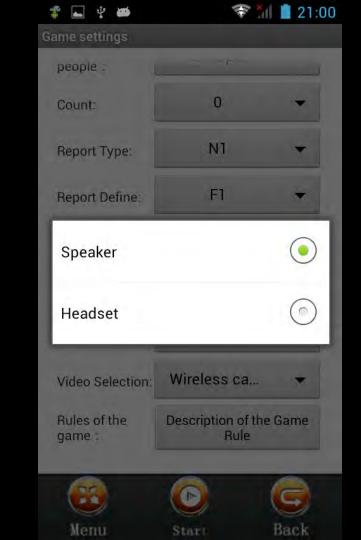
## Intercepting radio-command



2-FSK modulation

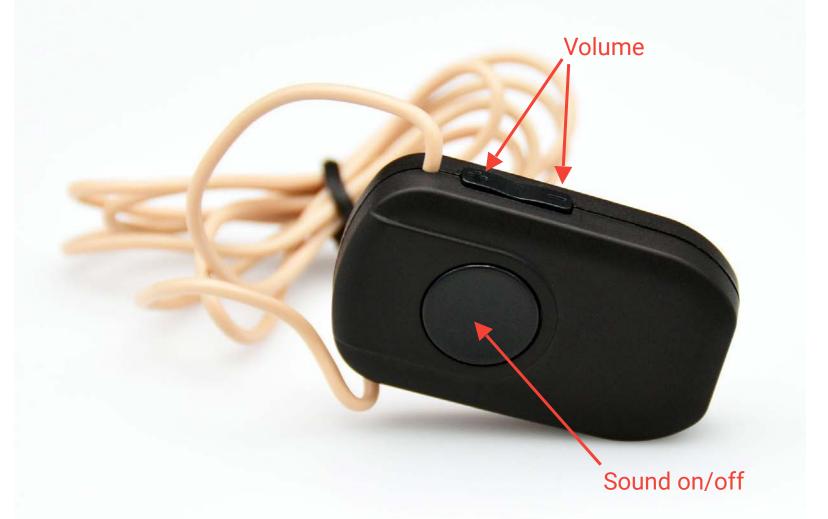
Center frequency: 868.289 MHz

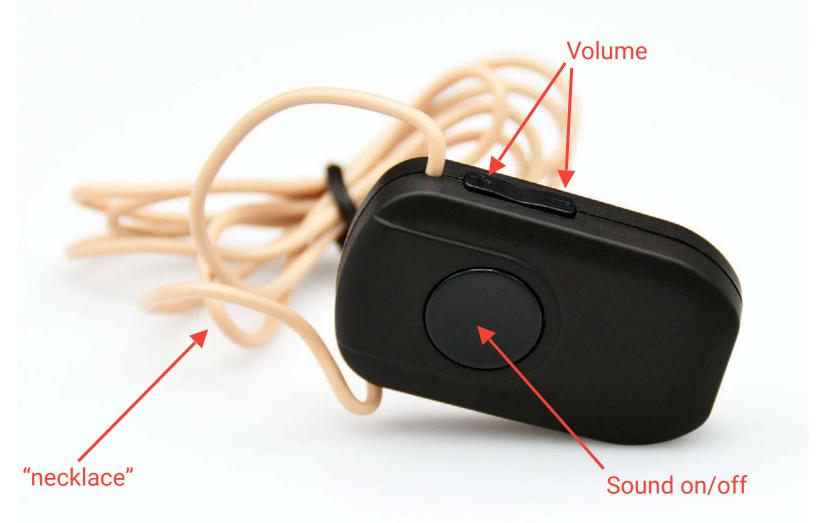
Data rate: 2400bps Measured  $\Delta f = 19kHz$ 













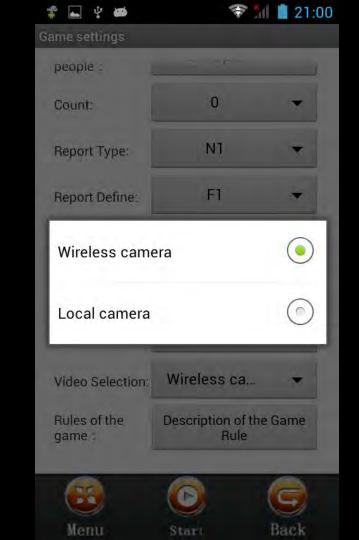




# Sneaky time display







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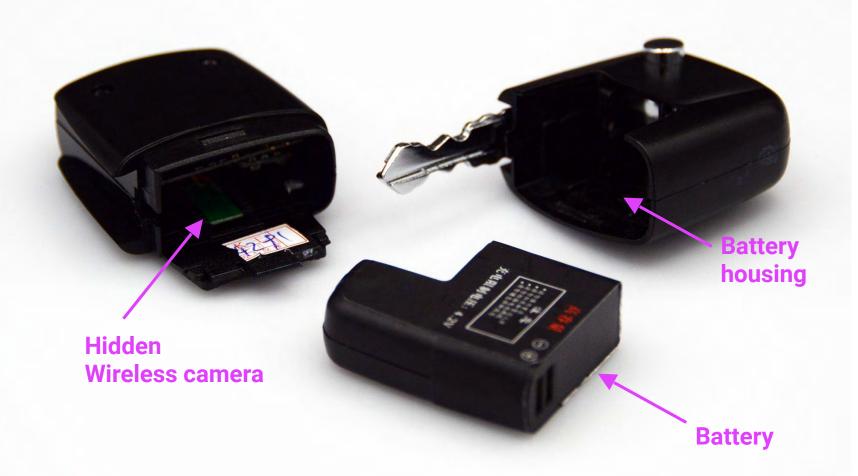




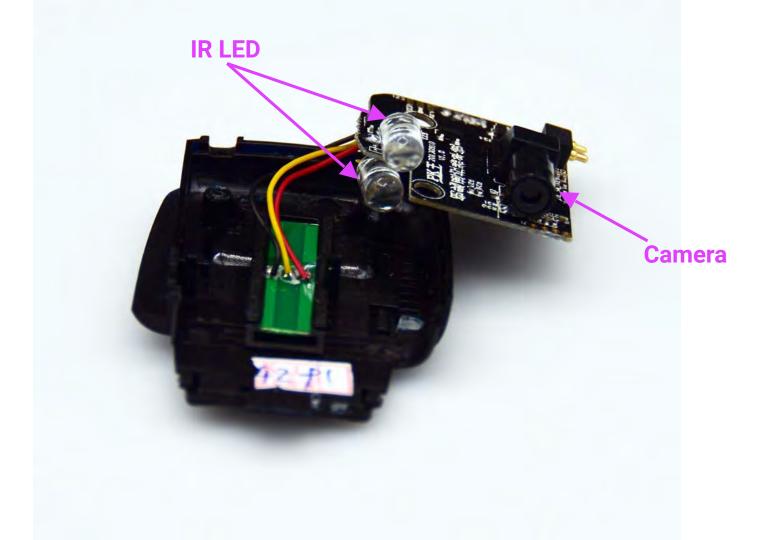


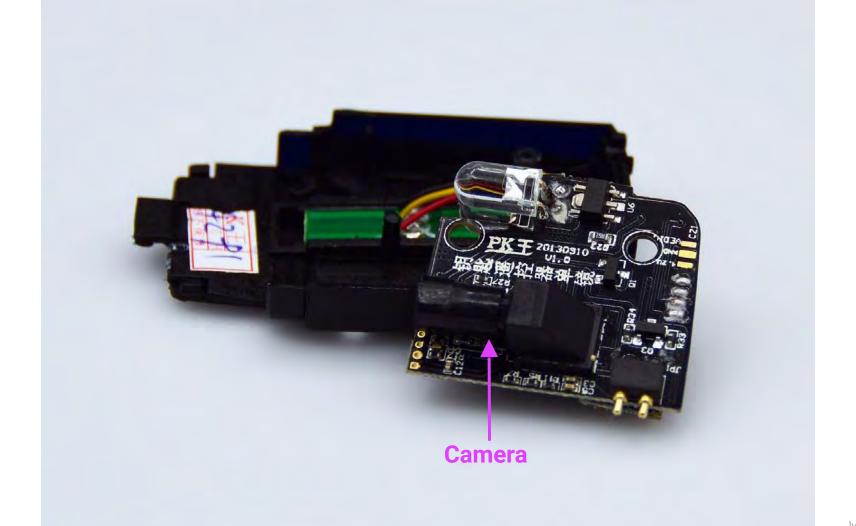


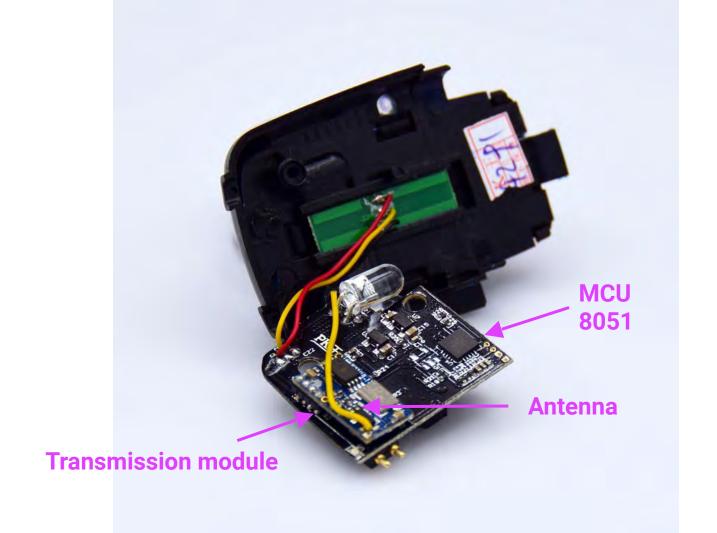








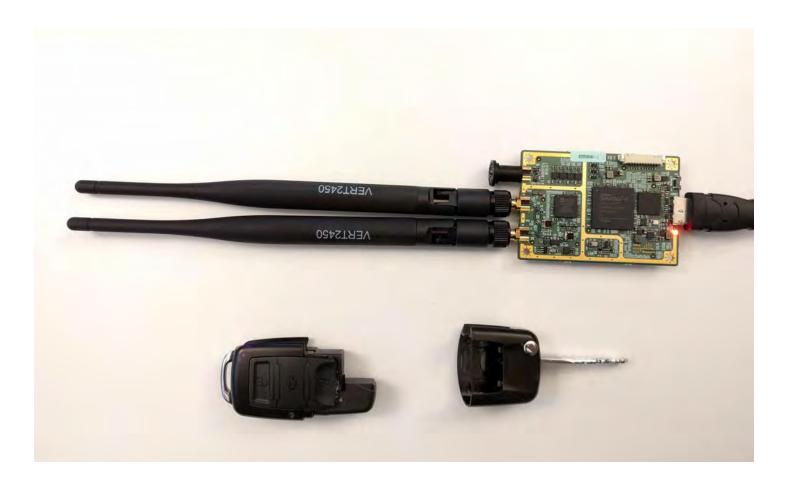


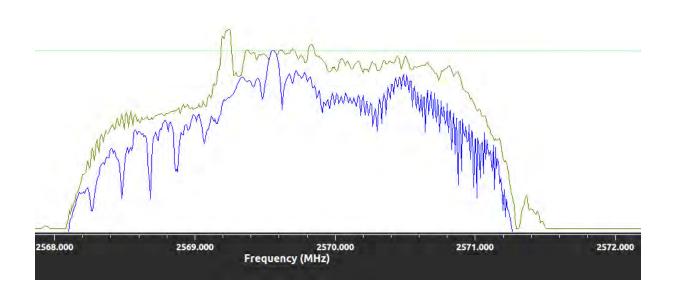


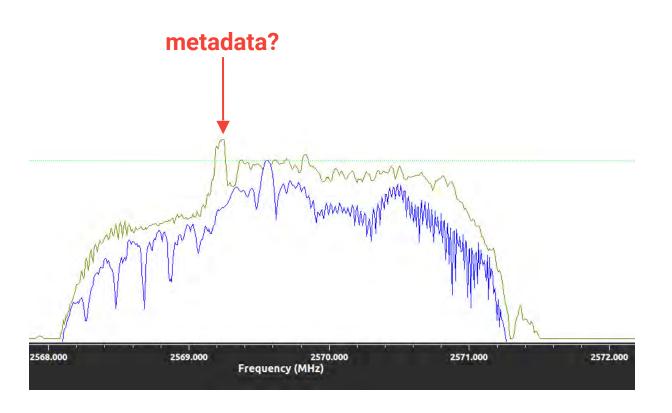
### Transmission module VM152T

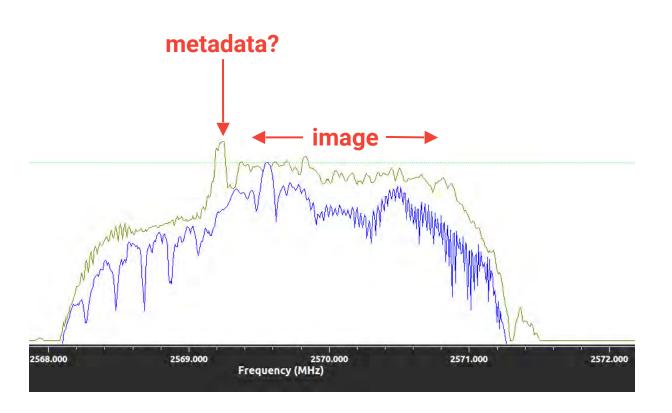


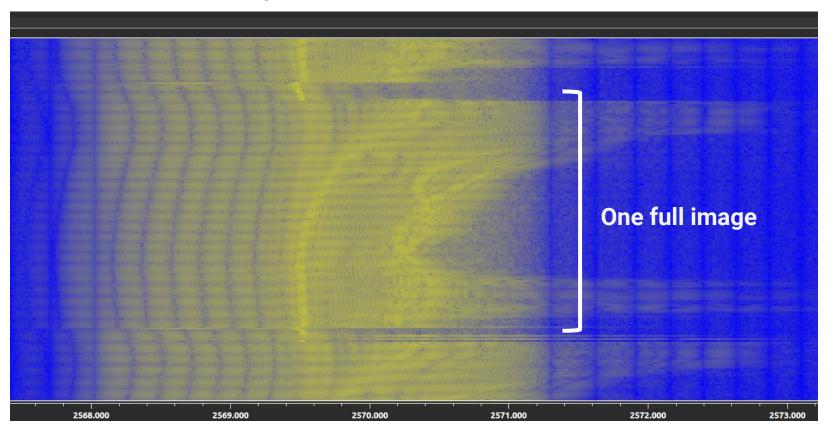
```
传输频道频率 (transmission frequency group):
CH1:2370MHz CH2:2570MHz
1.3 调制类型 (Modulation type): FM
2 结构规格书 ( Mechanical Specification )
VM152T Please refer to Figure 1.
3 环境条件 (Environmental Specification)
3.1 工作温度 (Temperature ) -10°C ~ +60°C
4 测试条件 (Test Condition)
4.1 周边环境温度 (Ambient temperature): 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
```













### 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

