

## AC104X 软件问题整理

链接：  
提取码：

以下是杰理客户问题反馈的二维码图片，可以通过微信扫二维码填写反馈！

也可以通过访问链接填写反馈：<https://www.wjx.cn/vj/O1EbvrN.aspx>

我们将第一时间安排对应工程协助解决！



杰理开源社区国内仓库 <https://gitee.com/Jieli-Tech>

<https://gitee.com/Jieli-Tech/fw-AD15N/issues> 这里有一些社区开发者的问题反馈，遇到问题可以先去这里看看。

1. 串口设置好以后打印乱码，内部晶振没有校准，需要加下下面这段代码-210610hwx.....	3
2.强制升级-210610hwx.....	3
3.DAC 输出方式设置，可以选择模拟输出和 PWM 输出-210610hwx.....	3
4.SD 卡 IO 设置-210610hwx.....	4
5.播 MP3 提示音功能-210610hwx.....	5
6.V102 版本 SDK 播放变调-210610hwx.....	8
7.进入 soft off 后插拔 sd 卡会复位-210610hwx.....	8
8.添加定时器中断-210610hwx.....	9
9.输出 3 路 PMW-210610hwx.....	10
10.V102 版本 SDK 加 FLASH 连电脑传文件和播放-210610hwx.....	12
11.无缝循环播放 210702hwx.....	13
12.AD 系列 MIDI 功能使用说明-210705hwx.....	14
13.串口通信 串口接收 IO 需要设置数字功能-210715hwx.....	15
14.增加一个输入捕捉通道-210729hwx.....	15
15.睡眠以后定时唤醒系统继续跑不复位-210730hwx.....	20
16.检测 MIC 能量自动录音自动播放参考-210809hwx.....	21
17.V104 以前的 SDK 可能出现有些芯片音乐播放速度快-210902hwx.....	22
18.编译提示 FW 文件工具需要更新-210902hwx.....	22
19.V110 及以前的版本开了多种解码格式插卡到播放等待的时间长-211116hwx.....	22
20. V110 版本 sdk 在所有模式下打开喊话增加 mic 自动 mute-211118hwx.....	23
21.V110 版本增加加密文件播放功能-211125hwx.....	23

## 1.串口设置好以后打印乱码，内部晶振没有校准，需要加下下面这段代码-210610hwx

生产烧录的时候要屏蔽这段

```
int c_main(int cfg_addr)
{
#ifdef 1
    /******debug code*****/
    JL_PLL->CON1 = 0XA403730; //me
    // JL_PLL->CON1 = 0XA40372d; //卓豪
    JL_PLL->CON1 = 0XA403724; //测试部
    JL_PLL->CON0 |= BIT(0); //EN
    volatile int i=0;
    for(i=0; i<0xfffff; i++);
    JL_PLL->CON0 |= BIT(1); //RST
    for(i=0; i<0xfffff; i++);
    /******

```

## 2.强制升级-210610hwx

用 4.0 版本升级工具把第二档搬上去。如果还不行就把升级工具升级到最新版本。

## 3.DAC 输出方式设置，可以选择模拟输出和 PWM 输出-210610hwx

```
#define DAC_MODE_1_A ( DAC_PWM ) //PWM
// 以下 DSM 模式暂时皆不可用
// #define DAC_MODE_1_B ( DAC_DSM | DAC_DSM11 )
// #define DAC_MODE_1_C ( DAC_DSM | DAC_DSM2 )
// #define DAC_MODE_1_D ( DAC_DSM | DAC_DSM3 )
// #define DAC_MODE_2_A ( DAC_DSM | DAC_DSM7 )
// #define DAC_MODE_3_A ( DAC_PWM )
// #define DAC_MODE_3_B ( DAC_DSM | DAC_DSM11 )

```

```
// #define DAC_MODE_3_C    ( DAC_DSM | DAC_DSM2 )
// #define DAC_MODE_3_D    ( DAC_DSM | DAC_DSM3 )
// #define DAC_MODE_4_A    ( DAC_DSM | DAC_DSM2 )
#define DAC_MODE_5_A    ( DAC_DSM | DAC_DSM7 ) //模拟信号
#define DAC_CURR_MODE    DAC_MODE_5_A
```

## 4.SD 卡 IO 设置-210610hwx

芯片内部只有一组卡口，不管选择那组卡口 SDMMCA\_EN 不需要修改。  
在这里设置 sd 卡。

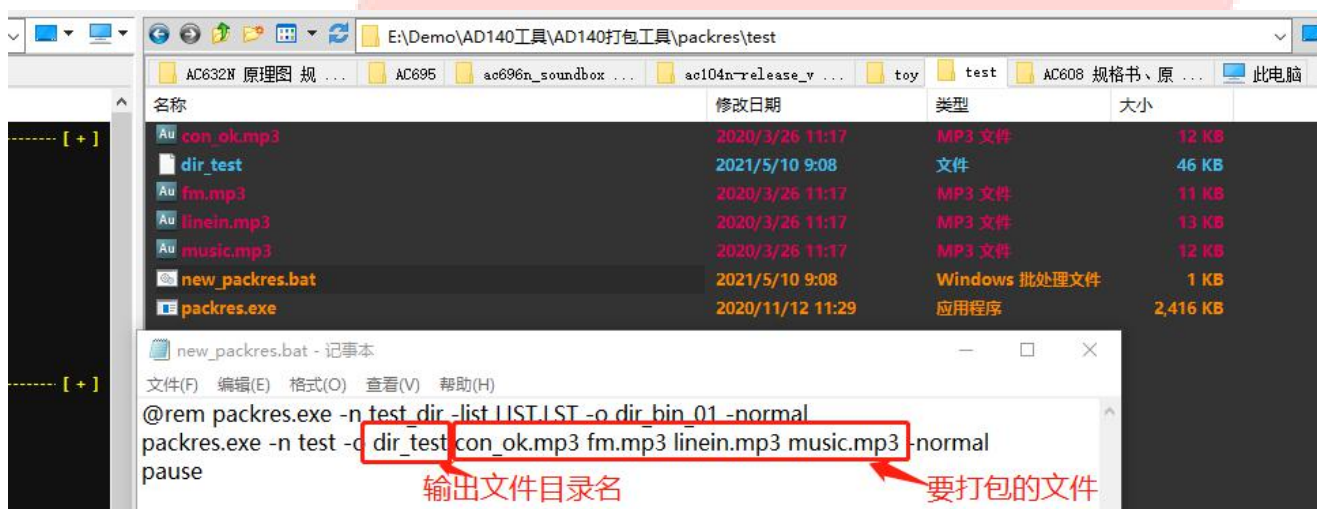
```
//SH54:
//SD A 组 IO:    CMD:PA02    CLK:PA01    DAT:PA03
//SD B 组 IO:    CMD:PA12    CLK:PA11    DAT:PA10
//SD C 组 IO:    CMD:PA05    CLK:PA04    DAT:USBDM
//SD D 组 IO:    CMD:PA05    CLK:PA04    DAT:PA06
//SH55:
//SD A 组 IO:    CMD:PA02    CLK:PA01    DAT:PA03
//SD B 组 IO:    CMD:PB01    CLK:PB00    DAT:PB02
//SD C 组 IO:    CMD:PB05    CLK:PB04    DAT:PB06
//SD D 组 IO:    CMD:PA07    CLK:PA06    DAT:PA08
#if TFG_SD_EN
SD0_PLATFORM_DATA_BEGIN(sd0_data)
    .port                = 'B',
    .data_width          = 1,
    .speed               = 8000000,
#if 0 //CMD 检测
    .detect_mode         = SD_CMD_DECT,
    .detect_func         = sdmmc_0_cmd_detect,
#endif
#if 1 //CLK 检测
    .detect_mode         = SD_CLK_DECT,
    .detect_func         = sdmmc_0_clk_detect,
    .detect_io_level     = 0, //0:低电平检测到卡    1:高电平检测到卡
#endif
#if 0 //IO 检测
    .detect_mode         = SD_IO_DECT,
    .detect_func         = sdmmc_0_io_detect,
    .detect_io           = IO_PORTx_xx, //用于检测的引脚
    .detect_io_level     = x, //0:低电平检测到卡    1:高电平检测到卡
#endif
    .power               = NULL,
    .priority             = 3,
```

```
SD0_PLATFORM_DATA_END()
```

```
#endif
```

## 5.播 MP3 提示音功能-210610hwx

5.1 先用资源文件打包工具把提示音打包成一个文件,拿到新的打包工具,参考以下放大做成打包好的文件。



5.2 在批处理里面加上刚才做好的文件

```
download.bat - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
%OBJDUMP% -section-headers %NAME%.elf
%OBJDUMP% -d -print-imm-hex -print-dbg %NAME%.elf > %NAME%.lst

%OBJCOPY% -O binary -j .app_code %NAME%.elf %NAME%.bin
%OBJCOPY% -O binary -j .data %NAME%.elf data.bin
%OBJCOPY% -O binary -j .debug_data %NAME%.elf debug_data.bin
%OBJDUMP% -section-headers %NAME%.elf
%OBJDUMP% -t %NAME%.elf > %NAME%.symbol.txt

copy /b %NAME%.bin+data.bin+debug_data.bin app.bin
copy app.bin mbox/app.bin

)

cd mbox
isd_download.exe -tonorflash -dev sh54 -boot 0xb00 -div8 -wait 300 -uboot uboot.boot -
uboot_compress -app app.bin 0x33800 -res dir_test

@REM
```

5.3 打开 FLASH 里面文件的接口 SDK 默认就有，改成自己的目录即可。打开文件成功以后用文件句柄调用开始解码。解码结束以后需要释放资源

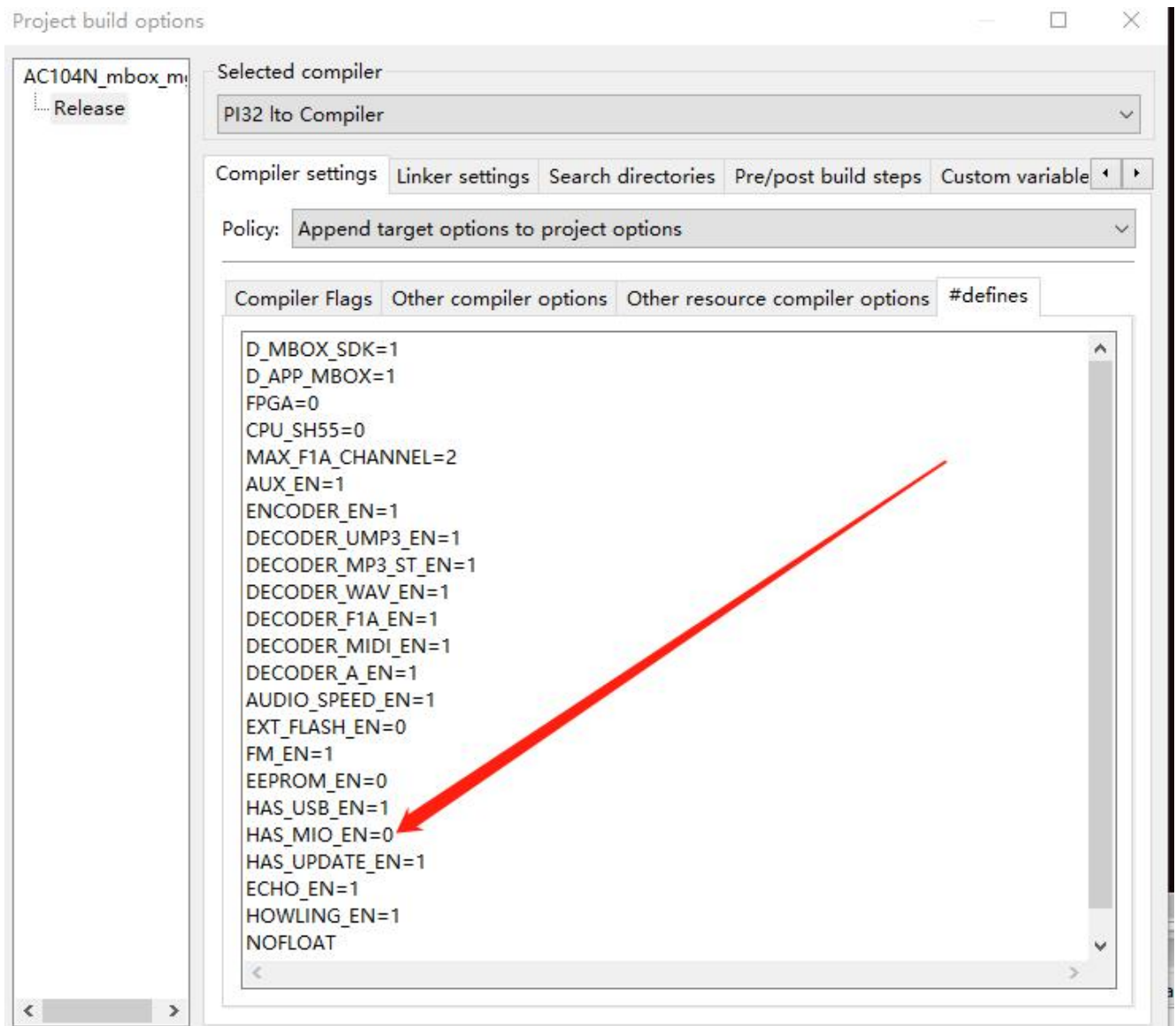


```
472  #if 1
473  #define vfs_demo_show(ptr,err)          \
474      log_info("Demo 0x%x : %s",err,ptr); \
475      if(0 != err){                       \
476          return ;                       \
477      }
478
479
480  #include "decoder_api.h"
481  extern dec_obj *decoder_io(void *pfile, u32 dec_ctl, dp_buff *dbuff, u8 loop);
482  static u8 demo_buff[512];
483  extern bool user_start_decode(void *pvfile);
484  extern bool start_decode(bool break_point);
485  void vfs_demo(void)
486  {
487      void *pvfs = 0;
488      void *pvfile = 0;
489      void *bp_info = NULL;
490      u32 err;
491      int play_err;
492      log_info("vfs init !!!\n");
493      vfs_init();
494      log_info("vfs init finish !!!\n");
495      err = vfs_mount(&pvfs, (void *)NULL, (void *)NULL);
496      vfs_demo_show("vfs_mount\n", err);
497      err = vfs_openbypath(pvfs, &pvfile, "/dir_test/fm.mp3");
498      vfs_demo_show("vfs_openbypath\n", err);
499      // err = vfs_read(pvfile, demo_buff, 512);
500      log_info("vfs read len : %d\n", err);
501      // log_info_hexdump(demo_buff, 512);
502      // start_decode(0);
503      log_info(">>>vfs_demo-pvfile:%x \n", (u32)pvfile);
504      user_start_decode(pvfile);
505      return;
506  }
507  #endif
508
```

```
318  bool user_start_decode(void *user_pvfile)
319  {
320      void *bp_info = NULL;
321
322      log_info(">>>user_pvfile:%x \n", (u32)user_pvfile);
323      p_dec_obj = decoder_io(user_pvfile, BIT_WAV | BIT_UMP3 /*|BIT_UMP3 | BIT_F1A1 | BIT_MIDI */ |
324      BIT_MP3_ST, bp_info, 0);
325      if (!p_dec_obj) {
326          Music_Play_var.bPlayStatus = MAD_STOP;
327          log_info("start decode error !!!\n");
328          return false;
329      }
330      Music_Play_var.bPlayStatus = MAD_PLAY;
331      return true;
332  }
333
```

## 6.V102 版本 SDK 播放变调-210610hwx

关掉工程选项里面的 MIO



## 7.进入 soft off 后插拔 sd 卡会复位-210610hwx

SD 供电串联电阻加大（4.7 欧姆），另外 VDDIO 电源电容加大（106）.soft off 的时候 vddio 电流档会变弱，会可能出现拉电复位的情况。



## 8.添加定时器中断-210610hwx

注意中断函数放在 RAM 里面，客户自己加的代码不要太多否则 RAM 不够。

```
__attribute__((weak))
AT(.tick_timer_code)
void user_timer2_ram_loop(void)
{
    // putchar('1');
}
```

```
void user_timer2_loop(void){

}
```

```
SET(interrupt(""))
AT(.tick_timer_code)
void user_timer2_isr()
{
    /*
     *用户的 timer 函数不能加入到这里,加到 tick_timer_loop
     * */
    //bit_clr_swi(TIME0_INIT);
    JL_TMR2->CON |= BIT(6);
}
```

```
user_timer2_ram_loop();
```

```
// user_timer2_loop();
}
```

```
void user_timer2_init(void)
{
    tt_printf("----user_timer2_init \n");
    HWI_Install(IRQ_TIME2_IDX, (u32)user_timer2_isr, IRQ_IRTMR_IP) ; //timer0_isr
    JL_TMR2->CNT = 0X00;
    JL_TMR2->PRD = (sys_clock_get() / 1000) * 2;
    JL_TMR2->CON |= BIT(0);
}
```

```
tt_printf("user_timer2_init--end \n");
}
```

## 9.输出 3 路 PMW-210610hwx

```
user_pwm_init(IO_PORTA_14,100 ,0,1);
user_pwm_init(IO_PORTA_05,200 ,1,0);
user_pwm_init(IO_PORTA_07,150 ,2,1);
```

```
#define PWM_FRE          3000
void user_pwm_init(u32 port,u16 pwm_wide,u32 pwn_ch1,bool output)
{
#if 1

    log_info("mio pwm init -> pwn_ch1 : %d\n", pwn_ch1);
    switch (pwn_ch1)
    {
    case 0:
        if(output){
            SFR(JL_IOMC->IOMC3, 0, 3, 0);    //输出到 OUTPUT 0
```

```
        // IO 选择输出 OUTPUT 信号
        gpio_set_pull_up(port, 1);
        gpio_set_pull_down(port, 1);
        gpio_set_direction(port, 0);
        gpio_set_die(port, 0);
    }else{
        gpio_set_direction(port, 0);
        gpio_set_die(port, 1);
        SFR(JL_IOMC->IOMC0, 16, 1, 1);    //输出到 PWM 默认 IO
    }
    JL_PWM->TMR0_PR = sys_clock_get() / PWM_FRE;
    JL_PWM->CH0_CMP = (sys_clock_get() / PWM_FRE) * pwm_wide / 255; //pwm_var 范围
在 0-255
    JL_PWM->TMR0_CON = BIT(5);
    break;
case 1:
    if(output){
        gpio_set_pull_up(port, 1);
        gpio_set_pull_down(port, 1);
        gpio_set_direction(port, 0);
        SFR(JL_IOMC->IOMC3, 0, 3, 1);
        gpio_set_die(port, 0);
    }else{
```

```
        gpio_set_direction(port, 0);
        gpio_set_die(port, 1);
        SFR(JL_IOMC->IOMC0, 17, 1, 1);
    }
    JL_PWM->TMR1_PR = sys_clock_get() / PWM_FRE;
    JL_PWM->CH1_CMP = (sys_clock_get() / PWM_FRE) * pwm_wide / 255; //pwm_var 范围在
0-255
    JL_PWM->TMR1_CON = BIT(5);
    break;
case 2:
    if(output){
        gpio_set_pull_up(port, 1);
        gpio_set_pull_down(port, 1);
        gpio_set_direction(port, 0);
        SFR(JL_IOMC->IOMC3, 3, 3, 0);
        gpio_set_die(port, 1);
    }else{
        gpio_set_direction(port, 0);
        gpio_set_die(port, 1);
        SFR(JL_IOMC->IOMC0, 18, 1, 1);
    }
    JL_PWM->TMR2_PR = sys_clock_get() / PWM_FRE;
    JL_PWM->CH2_CMP = (sys_clock_get() / PWM_FRE) * pwm_wide / 255; //pwm_var 范围在
0-255
    JL_PWM->TMR2_CON = BIT(5);
    break;
case 3:
    if(output){
        gpio_set_pull_up(port, 1);
        gpio_set_pull_down(port, 1);
        gpio_set_direction(port, 0);
        SFR(JL_IOMC->IOMC3, 3, 3, 1);
        gpio_set_die(port, 1);
    }else{
        gpio_set_direction(port, 0);
        gpio_set_die(port, 1);
        SFR(JL_IOMC->IOMC0, 19, 1, 1);
    }
    JL_PWM->TMR3_PR = sys_clock_get() / PWM_FRE;
    JL_PWM->CH3_CMP = (sys_clock_get() / PWM_FRE) * pwm_wide / 255; //pwm_var 范围在
0-255
    JL_PWM->TMR3_CON = BIT(5);
    break;
```

```
default:
    break;
}
```

```
SFR(JL_PWM->PWMCON1, (1 + pwn_ch1 * 4), 3, pwn_ch1);
JL_PWM->PWMCON0 |= BIT(8 + pwn_ch1);
JL_PWM->PWMCON0 |= BIT(pwn_ch1);
```

```
#else
    u8 chl = pwn_ch1;
#define MIO_API_PWM_PORT    IO_PORTA_05
#define PWM_FRE              3000
    log_info("mio pwm init -> chl : %d\n", chl);
    // gpio_set_pull_up(MIO_API_PWM_PORT, 1);
    // gpio_set_pull_down(MIO_API_PWM_PORT, 1);
    // SFR(JL_IOMC->IOMC3, 0, 3, 0);
    gpio_set_direction(MIO_API_PWM_PORT, 0);
    gpio_set_die(MIO_API_PWM_PORT, 0);
    JL_PWM->TMR0_PR = sys_clock_get() / PWM_FRE;
    JL_PWM->CH0_CMP = (sys_clock_get() / PWM_FRE) * 199 / 255; //pwm_var 范围在 0-255
    SFR(JL_PWM->PWMCON1, (1 + chl * 4), 3, chl);
    JL_PWM->TMR0_CON = BIT(5);
    JL_PWM->PWMCON0 |= BIT(8 + chl);
    JL_PWM->PWMCON0 |= BIT(chl);
#endif
}
```

## 10.V102 版本 SDK 加 FLASH 连电脑传文件和播放-210610hxx

参考程序 [https://pan.baidu.com/s/1kqKmgIAU\\_QZYMko-wm5TNA](https://pan.baidu.com/s/1kqKmgIAU_QZYMko-wm5TNA)

提取码: 8888

## 11.无缝循环播放 210702hwx

最后一个参数设置 255 一直循环。

```
dec_obj *decoder_io(void *pfile, u32 dec_ctl, dp_buff *dbuf, u8 loop)
```

如果是 AD14 或者 AD15 还要在音频原文件要在转换的时候选上无缝循环的选项。



开了断点记忆和无限循环在上播断点的时候会从断点的位置开始到结束一直循环。需要按照下面修改。

```
#if 0
    clear_dp(dbuf);
    if (0 != loop) { // (dec_ctl & BIT_LOOP)
        p_dec->loop = loop;
        log_info("get loop dp\n");
        if (true == get_dp(p_dec, dbuf)) {
            log_info(" -loop save succ!\n");
            p_dec->p_dp_buf = check_dp(dbuf);
        } else {
            log_info(" -loop save fail!\n");
        }
    }
}
#else
    u8 MUSIC_PLAY_FROM_START = (check_dp(dbuf) == 0);
```

```
    clear_dp(dbuf);
    if (0 != loop) { // (dec_ctl & BIT_LOOP)
        static dp_buff loop_dbuff;
```



```
        p_dec->loop = loop;
    if (MUSIC_PLAY_FROM_START)
    {
        log_info("*****get loop dp*****\n");
        if (true == get_dp(p_dec, &loop_dbuff)) {
            vm_write(VM_LOOP_BP, (u8 *)&loop_dbuff, sizeof(dp_buff));
            p_dec->p_dp_buf = check_dp(&loop_dbuff);
        } else {
            log_info(" -loop save fail!\n");
        }
    }
    else
    {
        log_info("*****get loop bp from vm *****\n");
        vm_read(VM_LOOP_BP, (u8 *)&loop_dbuff, sizeof(dp_buff));
        p_dec->p_dp_buf = check_dp(&loop_dbuff);
    }
}
```

```
#endif
```

如果是 AC104 下面这里需要修改, 解决断点和循环冲突的问题。

```
298 bool start_decode(bool break_point)
299 {
300     void *bp_info = NULL;
301     #ifdef BREAK_POINT_PLAY_EN
302     if( (break_point) || (playfile.play_mode == REPEAT_ONE))
303     {
304         bp_info = &dbuff; ← 确保循环播放的时候能到这里
305     }
306 #endif
307     memset(&dbuff, 0, sizeof(dbuff));
308     log_info("*****>>pvfile:%x \n", (u32)pvfile);
309     p_dec_obj = decoder_io(pvfile, BIT_WAV | BIT_UMP3 /*|BIT_UMP3 | BIT_F1A1 | BIT_MIDI */
310                             BIT_MP3_ST, bp_info, 255);
311     if (!p_dec_obj) {
312         Music_Play_var.bPlayStatus = MAD_STOP;
313         log_info("start decode error !!!\n");
314         return false;
315     }
316     Music_Play_var.bPlayStatus = MAD_PLAY;
317     return true;
318 }
```

## 12.AD 系列 MIDI 功能使用说明-210705hwx

链接: <https://pan.baidu.com/s/1aRlafU0LSYlxhKWw8GZbNA>

提取码: 8888

## 13.串口通信 串口接收 IO 需要设置数字功能-210715hwx

```
659     }
660     u8 gpio_set_uart1(u32 ut_ch)  //ch=-1; 0; 1; 2; 3
661     {
662         if (ut_ch == -1) {
663             return 0;
664         }
665         JL_IOMC->IOMC0 |= BIT(7);
666         SFR(JL_IOMC->IOMC0, 8, 2, ut_ch); //USB
667         if (ut_ch == 0) {
668             gpio_set_direction(IO_PORTA_05, 1); //in /*JL_PORTA->DIR |= BIT(5);*/
669             gpio_set_direction(IO_PORTA_04, 0); //out /*JL_PORTA->DIR &= ~BIT(4);*/
670             gpio_set_pull_up(IO_PORTA_04, 1);
671             gpio_set_pull_up(IO_PORTA_05, 1);
672             gpio_set_die(IO_PORTA_05, 1);
673             return 1;
674         }
675     }
```

## 14.增加一个输入捕捉通道-210729hwx

AC104 103 版本 SDK 的红外用到了 TIMER2 和 IRFLT 模块。IRFLT 只是相当于一个信号过滤的模块，对于脉冲宽度的测量实际还是通过 TIMER 来实现的。

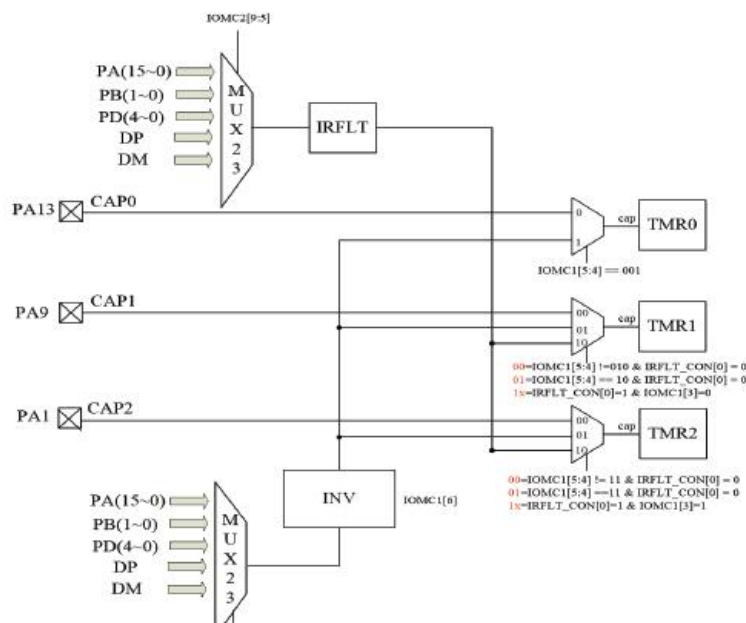
## 第 12 章 红外滤波模块 (IRFLT)

## 12.1 模块说明

IRFLT 是一个专用的硬件模块，用于去除掉红外接收头信号上的窄脉冲信号，提升红外接收解码的质量。

IRFLT 使用一个固定的时基对红外信号进行采样，必须连续 4 次采样均为‘1’时，输出信号才会变为‘1’，必须连续 4 次采样均为‘0’时，输出信号才会变为‘0’。换言之，脉宽小于 4 倍时基的窄脉冲将被滤除。改变该时基的产生可兼容不同的系统工作状态，也可在一定范围内调整对红外信号的过滤效果。

通过对 IOMC (IO re-mapping) 寄存器的配置, 可以将 IRFLT 插入到系统 2 个 timer 中某一个的捕获引脚之前。例如通过 IOMC 寄存器选择了 IRFLT 对 timer1 有效, 并且 IRFLT\_EN 被使能之后, 则 IO 口的信号会先经过 IRFLT 进行滤波, 然后再送至 timer1 中进行边沿捕获。



这里增加了 TIMER0 用默认的 PA13 来检测脉宽。

```
// 根据封装修改 IO 和 timer
// 注意红外默认用的是 TIMER2 的映射通道
// TIMER0 默认输入捕捉 IO PA13
// TIMER1 默认输入捕捉 IO PA09
// TIMER2 默认输入捕捉 IO PA01
```

```
#define USER_CAP_IO          IO_PORTA_13 //timer 默认的 io 需要映射可以参考红外按键
#define USER_CAP_TMR         JL_TMR0
#define IRQ_USER_CAP_TMR     IRQ_TIME0_IDX
```

```
#define INPUT_CHANNLE0_SRC_SEL(x)      SFR(JL_IOMC->IOMC2, 0, 5, x)
#define CAP_TIMER_SEL(x)               SFR(JL_IOMC->IOMC1, 4, 2, x)
```

```
u16 user_cap_prd;
```

```
static const u16 timer_div[] = {
    /*0000*/    1,
    /*0001*/    4,
    /*0010*/    16,
    /*0011*/    64,
    /*0100*/    2,
    /*0101*/    8,
    /*0110*/    32,
    /*0111*/    128,
    /*1000*/    256,
    /*1001*/    4 * 256,
    /*1010*/    16 * 256,
    /*1011*/    64 * 256,
    /*1100*/    2 * 256,
    /*1101*/    8 * 256,
    /*1110*/    32 * 256,
    /*1111*/    128 * 256,
};
```

```
/*-----*/
/**@brief    time1 红外中断服务函数
    @param    void
    @param    void
    @return    void
    @note     void timer1_ir_isr(void)
*/
/*-----*/
static u32 data_temp = 0;
static u8 cnt_temp = 0;
__interrupt
static void user_cap_isr(void)
{ //采样中不能在中断里面加打印
    u16 bCap1;
    u8 cap = 0;
```

```
static u8 cnt = 0;
```

```
USER_CAP_TMR->CON |= BIT(6);
```

```
bCap1 = USER_CAP_TMR->PRD;  
USER_CAP_TMR->CNT = 0;  
cap = bCap1 / user_cap_prd;
```

```
if (cap <= 1) {  
    data_temp >>= 1;  
    cnt_temp++;  
} else if (cap <= 3){  
    data_temp >>= 1;  
    cnt_temp++;  
    data_temp |= 0x8000;  
}else if ((cap == 13) && (cnt_temp < 8)){  
    data_temp = 0;  
    cnt_temp= 0;  
}  
if (cnt_temp == 32) {  
    log_info("data_temp:%x\n",data_temp );  
}  
}
```

```
void user_cap_outtime(void)  
{  
    static u8 wait_cnt = 0;  
    if(cnt_temp){  
        wait_cnt++;  
        if(wait_cnt > 20){  
            wait_cnt = 0;  
            data_temp = 0;  
            cnt_temp= 0;  
        }  
    }  
}
```

```
/*-----*/  
/**@brief    ir 按键初始化  
  @param    void  
  @param    void  
  @return   void  
  @note     void set_ir_clk(void)
```



```
((cnt - 1)* 分频数)/lsb_clk = 1ms
*/
/*-----*/
#define OSC_Hz          12000000L
```

```
// 根据实际要捕捉的信号频率调整 TIMER 的分频和 prd_cnt
/* #define MAX_TIME_CNT 0x07ff //分频准确范围, 更具实际情况调整 */
/* #define MIN_TIME_CNT 0x0030 */
void user_cap_timer_init(void)
{
    u32 clk;
    u32 prd_cnt;
    /* u8 index; */
    clk = OSC_Hz;//clock_get_lsb_freq();
```

```
    clk /= (1000 * 64);
    clk *= 1; //1ms for cnt
    prd_cnt = clk;
    user_cap_prd = prd_cnt;
```

```
    USER_CAP_TMR->CON = BIT(6);
    USER_CAP_TMR->PRD = 0;
    USER_CAP_TMR->CNT = 0;
    USER_CAP_TMR->CON = ((3 << 4) | (2 << 2) | (3 << 0)); //htc + falling edge
}
```

```
static void user_cap_io_init(void){
    gpio_set_direction(USER_CAP_IO, 1);
    gpio_set_die(USER_CAP_IO, 1);
    gpio_set_pull_up(USER_CAP_IO, 1);
}
```

```
/*-----*/
/**@brief    ir 按键初始化
 * @param    void
 * @param    void
 * @return    void
 * @note     void ir_key_init(void)
 */
/*-----*/
```

```
int user_cap_init(void )
```

```
{  
    //timer1  
    r_printf("ir key init >>>\n");
```

```
request_irq(IRQ_USER_CAP_TMR, IRQ_IRTMR_IP, user_cap_isr, 0);
```

```
user_cap_io_init();    //初始化输入捕捉的 IO  
user_cap_timer_init();    //设置定时器
```

```
return 0;  
}
```

## 15.睡眠以后定时唤醒系统继续跑不复位-210730hwx

早期 SDK 做不了要这些版本才可以用

AC104 V104 和以上版本

AD14 V106 和以上版本

AD15V106 和以上版本

**sys\_power\_down(nuS)**

调用这个函数单位是微秒。注意如果开了看门狗最大只能设置看门狗复位时长的一半，如果传入的参数超过看门狗复位时间的一半不会生效。如果需要设置更长可以关闭看门狗。

**注意 AD14 v106 A0 版本外挂 FLASH 默认 SDK 进入睡眠以后无法唤醒需要做以下修改**

1.换库 <https://pan.baidu.com/s/1iCQwlyyKY2GZ623m9XxoDg> 提取码 8888

2.改这个宏

```
28  
29 *****power_param*****  
30  
31 #define TCFG_LOWPOWER_POWER_SEL        PWR_LDO15  
32 #define TCFG_LOWPOWER_BTOSC_DISABLE    0  
33 #define TCFG_LOWPOWER_LOWPOWER_SEL     SLEEP_EN  
34 //diom: 2.0~3.4*/  
35 #define TCFG_LOWPOWER_VDDIOM_LEVEL      VDDIOM_VOL_32V  
36 //diom: 2.0~3.4*/  
37 #define TCFG_LOWPOWER_VDDIOW_LEVEL      VDDIOW_VOL_28V  
38 #define TCFG_KEEP_FLASH_POWER_GATE     1  
39 #define TCFG_LOWPOWER_DAC_OPEN          1  
40 #define TCFG_NORFLASH_4BYTE_MODE        0  
41  
42 struct low_power_param power_param = {  
43     .config          = TCFG_LOWPOWER_LOWPOWER_SEL,    //0: sniff  
44     .btosc_hz         = 16000000,                    //外接晶振
```

## 16.检测 MIC 能量自动录音自动播放参考-210809hwx

参考代码位置 <https://pan.baidu.com/s/1EvdvoljdAqrrC5gdC1m1nQ> 提取码 8888

- 1.增加了一个 ms 模式，开机默认进入 app\_ms.
- 2.检测能量自动开始录音，检测到没有说话声音以后自动播放刚才的录音。
- 3.上述代码只是一个参考，用来告诉客户 LADC 采样的数据怎样计算，怎样控制录音和播放录音。具体开始和结束的阈值需要客户自己调整，或者客户可以重写整个判断开始结束的函数。

```
89 AT(.adc_oput_code)
90 int mic_energy_check(u8 *buff, len)
91 #define START_THRESHOLD_VALUE 400000
92 #define STOP_THRESHOLD_VALUE 100000
93 #define AD_DATA_CHECK_TIMES 20 //计算多少次AD数据
94 #define RECORD_DATA_CHECK_CNT 30 //计算多少次AD数据
95
96 s16 *buff_temp = (s16 *)buff;
97 static long int buff_total=0;
98 static long int data_total=START_THRESHOLD_VALUE/2;
99 static u8 data_cnt=0;
100 static u16 data_rec_cnt=0;
101 u8 cnt = len/2;
102
103 // 过滤掉最开始开MIC可能会导致的P0声
104 if((jiffies - start_time) < 10){
105     return 0;
106 }
107 if(ms_start_flag){
108     while(cnt--){
109         if(buff_temp[cnt] < 0){
110             buff_total -= buff_temp[cnt];
111         }else{
112             buff_total += buff_temp[cnt];
113         }
114     }
```

```
62 }
63
64 int record_play(void){
65     u32 decoder_type = BIT_A | BIT_UMP3 | BIT_SPEED;
66     // u32 decoder_type = BIT_A | BIT_UMP3 ;
67     ms_record_status = 2;
68     encode_stop();
69     decoder_init();
70     void *device = dev_open(__SFC_NANE, 0);
71     if (music_play(&music_obj, NULL, findex, decoder_type, device, MUSIC_MODE_
72 // log_info("music play succ \n");
73 }
74 return 0;
75 }
76
77 AT(.adc_oput_code)
78 u8 get_ms_record_status(void)
```

## 17.V104 以前的 SDK 可能出现有些芯片音乐播放速度快-210902hwx

换掉 uboot 文件重新编译或者升级到 V104 版本 SDK。

压缩包里面有一个 EXE 工具如果只有 FW 文件找不到代码了可以用这个工具直接生成新的 FW 文件。

链接: <https://pan.baidu.com/s/1aoAkZLo0t0XqYgyEZiXp0w> 提取码: n2wy

## 18.编译提示 FW 文件工具需要更新-210902hwx

```
-----  
E:\UJM\任务\新任务\21083172 (AC104移植SDK104) \app\post_bu  
错误: fw文件格式比工具新, 请使用最新版本工具.  
E:\UJM\任务\新任务\21083172 (AC104移植SDK104) \app\post_bu  
找不到 E:\UJM\任务\新任务\21083172 (AC104移植SDK104) \app\p  
错误: 无效的FW文件[jl_isd.fw], 请重新选择
```

双击这个下载新的工具即可



## 19.V110 及以前的版本开了多种解码格式插卡到播放等待的时间长-211116hwx

开了淡入淡出会导致再开始播放前停止解码的时间很长, 暂时用关掉淡入淡出的办法解决, 后续 SDK 会解决这个问题。

```
2  /*-----DAC FADE IN & OUT Configuration-----  
3  #ifdef D_MBOX_SDK  
4  #define      DAC_FADE_ENABLE      0  
5  #else  
6  #define      DAC_FADE_ENABLE      0  
7  #endif
```

## 20.V110 版本 sdk 在所有模式下打开喊话增加 mic 自动 mute-211118hwx

参考代码下载地址

链接: [https://pan.baidu.com/s/1Z5puysN\\_i4lM5uf3-ZEZvA](https://pan.baidu.com/s/1Z5puysN_i4lM5uf3-ZEZvA)

提取码: 8888

1. 在所有模式都可以调用  
user\_loudspeaker\_init 打开 MIC  
user\_loudspeaker\_off 关闭
2. 在 adc 中断里面增加了一个 MIC 自动 mute 的功能, 检测到持续 2 秒以上的低能量直接清零 MICbuff 数据达到降低底噪的效果。  
具体参数可以自己调整在这个函数里面 mic\_energy\_check  
STOP\_THRESHOLD\_VALUE 表示判断阈值 jiffies 这个是时间判断连续 2 秒小于阈值就清零数据, 客户可以自己调整。
3. 关于低电压底噪处理见开源社区 issues  
连接 <https://gitee.com/Jieli-Tech/fw-AD15N/issues/I4190H>
4. 如果对噪声还不满意只能从硬件优化。

## 21.V110 版本增加加密文件播放功能-211125hwx

加密文件的播放需要增加以下几个处理既可。

参考代码和加密工具下载地址

链接: <https://pan.baidu.com/s/1cGFNNfIH71Ayye0I8f9Jbw> 提取码: 8vne

1. 增加文件后缀名的识别, 让文件扫描的时候能找出这些文件。

```
130  /-----  
131  static const char scan_parm[] = "-t"  
132  |         |         |         |         |         |         |         |         |         |  
133  |         |         |         |         |         |         |         |         |         |  
134  |         |         |         |         |         |         |         |         |         |  
135  |         |         |         |         |         |         |         |         |         |  
136  |         |         |         |         |         |         |         |         |         |  
137  |         |         |         |         |         |         |         |         |         |  
138  |         |         |         |         |         |         |         |         |         |  
139  |         |         |         |         |         |         |         |         |         |  
140  |         |         |         |         |         |         |         |         |         |  
141  |         |         |         |         |         |         |         |         |         |  
142  |         |         |         |         |         |         |         |         |         |  
143  |         |         |         |         |         |         |         |         |         |  
144  |         |         |         |         |         |         |         |         |         |  
145  |         |         |         |         |         |         |         |         |         |  
146  |         |         |         |         |         |         |         |         |         |  
147  |         |         |         |         |         |         |         |         |         |  
148  |         |         |         |         |         |         |         |         |         |  
149  |         |         |         |         |         |         |         |         |         |  
150  |         |         |         |         |         |         |         |         |         |  
151  |         |         |         |         |         |         |         |         |         |  
152  |         |         |         |         |         |         |         |         |         |  
153  |         |         |         |         |         |         |         |         |         |  
154  |         |         |         |         |         |         |         |         |         |  
155  |         |         |         |         |         |         |         |         |         |  
156  |         |         |         |         |         |         |         |         |         |  
157  |         |         |         |         |         |         |         |         |         |  
158  |         |         |         |         |         |         |         |         |         |  
159  |         |         |         |         |         |         |         |         |         |  
160  |         |         |         |         |         |         |         |         |         |  
161  |         |         |         |         |         |         |         |         |         |  
162  |         |         |         |         |         |         |         |         |         |  
163  |         |         |         |         |         |         |         |         |         |  
164  |         |         |         |         |         |         |         |         |         |  
165  |         |         |         |         |         |         |         |         |         |  
166  |         |         |         |         |         |         |         |         |         |  
167  |         |         |         |         |         |         |         |         |         |  
168  |         |         |         |         |         |         |         |         |         |  
169  |         |         |         |         |         |         |         |         |         |  
170  |         |         |         |         |         |         |         |         |         |  
171  |         |         |         |         |         |         |         |         |         |  
172  |         |         |         |         |         |         |         |         |         |  
173  |         |         |         |         |         |         |         |         |         |  
174  |         |         |         |         |         |         |         |         |         |  
175  |         |         |         |         |         |         |         |         |         |  
176  |         |         |         |         |         |         |         |         |         |  
177  |         |         |         |         |         |         |         |         |         |  
178  |         |         |         |         |         |         |         |         |         |  
179  |         |         |         |         |         |         |         |         |         |  
180  |         |         |         |         |         |         |         |         |         |  
181  |         |         |         |         |         |         |         |         |         |  
182  |         |         |         |         |         |         |         |         |         |  
183  |         |         |         |         |         |         |         |         |         |  
184  |         |         |         |         |         |         |         |         |         |  
185  |         |         |         |         |         |         |         |         |         |  
186  |         |         |         |         |         |         |         |         |         |  
187  |         |         |         |         |         |         |         |         |         |  
188  |         |         |         |         |         |         |         |         |         |  
189  |         |         |         |         |         |         |         |         |         |  
190  |         |         |         |         |         |         |         |         |         |  
191  |         |         |         |         |         |         |         |         |         |  
192  |         |         |         |         |         |         |         |         |         |  
193  |         |         |         |         |         |         |         |         |         |  
194  |         |         |         |         |         |         |         |         |         |  
195  |         |         |         |         |         |         |         |         |         |  
196  |         |         |         |         |         |         |         |         |         |  
197  |         |         |         |         |         |         |         |         |         |  
198  |         |         |         |         |         |         |         |         |         |  
199  |         |         |         |         |         |         |         |         |         |  
200  |         |         |         |         |         |         |         |         |         |  
201  |         |         |         |         |         |         |         |         |         |  
202  |         |         |         |         |         |         |         |         |         |  
203  |         |         |         |         |         |         |         |         |         |  
204  |         |         |         |         |         |         |         |         |         |  
205  |         |         |         |         |         |         |         |         |         |  
206  |         |         |         |         |         |         |         |         |         |  
207  |         |         |         |         |         |         |         |         |         |  
208  |         |         |         |         |         |         |         |         |         |  
209  |         |         |         |         |         |         |         |         |         |  
210  |         |         |         |         |         |         |         |         |         |  
211  |         |         |         |         |         |         |         |         |         |  
212  |         |         |         |         |         |         |         |         |         |  
213  |         |         |         |         |         |         |         |         |         |  
214  |         |         |         |         |         |         |         |         |         |  
215  |         |         |         |         |         |         |         |         |         |  
216  |         |         |         |         |         |         |         |         |         |  
217  |         |         |         |         |         |         |         |         |         |  
218  |         |         |         |         |         |         |         |         |         |  
219  |         |         |         |         |         |         |         |         |         |  
220  |         |         |         |         |         |         |         |         |         |  
221  |         |         |         |         |         |         |         |         |         |  
222  |         |         |         |         |         |         |         |         |         |  
223  |         |         |         |         |         |         |         |         |         |  
224  |         |         |         |         |         |         |         |         |         |  
225  |         |         |         |         |         |         |         |         |         |  
226  |         |         |         |         |         |         |         |         |         |  
227  |         |         |         |         |         |         |         |         |         |  
228  |         |         |         |         |         |         |         |         |         |  
229  |         |         |         |         |         |         |         |         |         |  
230  |         |         |         |         |         |         |         |         |         |  
231  |         |         |         |         |         |         |         |         |         |  
232  |         |         |         |         |         |         |         |         |         |  
233  |         |         |         |         |         |         |         |         |         |  
234  |         |         |         |         |         |         |         |         |         |  
235  |         |         |         |         |         |         |         |         |         |  
236  |         |         |         |         |         |         |         |         |         |  
237  |         |         |         |         |         |         |         |         |         |  
238  |         |         |         |         |         |         |         |         |         |  
239  |         |         |         |         |         |         |         |         |         |  
240  |         |         |         |         |         |         |         |         |         |  
241  |         |         |         |         |         |         |         |         |         |  
242  |         |         |         |         |         |         |         |         |         |  
243  |         |         |         |         |         |         |         |         |         |  
244  |         |         |         |         |         |         |         |         |         |  
245  |         |         |         |         |         |         |         |         |         |  
246  |         |         |         |         |         |         |         |         |         |  
247  |         |         |         |         |         |         |         |         |         |  
248  |         |         |         |         |         |         |         |         |         |  
249  |         |         |         |         |         |         |         |         |         |  
250  |         |         |         |         |         |         |         |         |         |  
251  |         |         |         |         |         |         |         |         |         |  
252  |         |         |         |         |         |         |         |         |         |  
253  |         |         |         |         |         |         |         |         |         |  
254  |         |         |         |         |         |         |         |         |         |  
255  |         |         |         |         |         |         |         |         |         |  
256  |         |         |         |         |         |         |         |         |         |  
257  |         |         |         |         |         |         |         |         |         |  
258  |         |         |         |         |         |         |         |         |         |  
259  |         |         |         |         |         |         |         |         |         |  
260  |         |         |         |         |         |         |         |         |         |  
261  |         |         |         |         |         |         |         |         |         |  
262  |         |         |         |         |         |         |         |         |         |  
263  |         |         |         |         |         |         |         |         |         |  
264  |         |         |         |         |         |         |         |         |         |  
265  |         |         |         |         |         |         |         |         |         |  
266  |         |         |         |         |         |         |         |         |         |  
267  |         |         |         |         |         |         |         |         |         |  
268  |         |         |         |         |         |         |         |         |         |  
269  |         |         |         |         |         |         |         |         |         |  
270  |         |         |         |         |         |         |         |         |         |  
271  |         |         |         |         |         |         |         |         |         |  
272  |         |         |         |         |         |         |         |         |         |  
273  |         |         |         |         |         |         |         |         |         |  
274  |         |         |         |         |         |         |         |         |         |  
275  |         |         |         |         |         |         |         |         |         |  
276  |         |         |         |         |         |         |         |         |         |  
277  |         |         |         |         |         |         |         |         |         |  
278  |         |         |         |         |         |         |         |         |         |  
279  |         |         |         |         |         |         |         |         |         |  
280  |         |         |         |         |         |         |         |         |         |  
281  |         |         |         |         |         |         |         |         |         |  
282  |         |         |         |         |         |         |         |         |         |  
283  |         |         |         |         |         |         |         |         |         |  
284  |         |         |         |         |         |         |         |         |         |  
285  |         |         |         |         |         |         |         |         |         |  
286  |         |         |         |         |         |         |         |         |         |  
287  |         |         |         |         |         |         |         |         |         |  
288  |         |         |         |         |         |         |         |         |         |  
289  |         |         |         |         |         |         |         |         |         |  
290  |         |         |         |         |         |         |         |         |         |  
291  |         |         |         |         |         |         |         |         |         |  
292  |         |         |         |         |         |         |         |         |         |  
293  |         |         |         |         |         |         |         |         |         |  
294  |         |         |         |         |         |         |         |         |         |  
295  |         |         |         |         |         |         |         |         |         |  
296  |         |         |         |         |         |         |         |         |         |  
297  |         |         |         |         |         |         |         |         |         |  
298  |         |         |         |         |         |         |         |         |         |  
299  |         |         |         |         |         |         |         |         |         |  
300  |         |         |         |         |         |         |         |         |         |  
301  |         |         |         |         |         |         |         |         |         |  
302  |         |         |         |         |         |         |         |         |         |  
303  |         |         |         |         |         |         |         |         |         |  
304  |         |         |         |         |         |         |         |         |         |  
305  |         |         |         |         |         |         |         |         |         |  
306  |         |         |         |         |         |         |         |         |         |  
307  |         |         |         |         |         |         |         |         |         |  
308  |         |         |         |         |         |         |         |         |         |  
309  |         |         |         |         |         |         |         |         |         |  
310  |         |         |         |         |         |         |         |         |         |  
311  |         |         |         |         |         |         |         |         |         |  
312  |         |         |         |         |         |         |         |         |         |  
313  |         |         |         |         |         |         |         |         |         |  
314  |         |         |         |         |         |         |         |         |         |  
315  |         |         |         |         |         |         |         |         |         |  
316  |         |         |         |         |         |         |         |         |         |  
317  |         |         |         |         |         |         |         |         |         |  
318  |         |         |         |         |         |         |         |         |         |  
319  |         |         |         |         |         |         |         |         |         |  
320  |         |         |         |         |         |         |         |         |         |  
321  |         |         |         |         |         |         |         |         |         |  
322  |         |         |         |         |         |         |         |         |         |  
323  |         |         |         |         |         |         |         |         |         |  
324  |         |         |         |         |         |         |         |         |         |  
325  |         |         |         |         |         |         |         |         |         |  
326  |         |         |         |         |         |         |         |         |         |  
327  |         |         |         |         |         |         |         |         |         |  
328  |         |         |         |         |         |         |         |         |         |  
329  |         |         |         |         |         |         |         |         |         |  
330  |         |         |         |         |         |         |         |         |         |  
331  |         |         |         |         |         |         |         |         |         |  
332  |         |         |         |         |         |         |         |         |         |  
333  |         |         |         |         |         |         |         |         |         |  
334  |         |         |         |         |         |         |         |         |         |  
335  |         |         |         |         |         |         |         |         |         |  
336  |         |         |         |         |         |         |         |         |         |  
337  |         |         |         |         |         |         |         |         |         |  
338  |         |         |         |         |         |         |         |         |         |  
339  |         |         |         |         |         |         |         |         |         |  
340  |         |         |         |         |         |         |         |         |         |  
341  |         |         |         |         |         |         |         |         |         |  
342  |         |         |         |         |         |         |         |         |         |  
343  |         |         |         |         |         |         |         |         |         |  
344  |         |         |         |         |         |         |         |         |         |  
345  |         |         |         |         |         |         |         |         |         |  
346  |         |         |         |         |         |         |         |         |         |  
347  |         |         |         |         |         |         |         |         |         |  
348  |         |         |         |         |         |         |         |         |         |  
349  |         |         |         |         |         |         |         |         |         |  
350  |         |         |         |         |         |         |         |         |         |  
351  |         |         |         |         |         |         |         |         |         |  
352  |         |         |         |         |         |         |         |         |         |  
353  |         |         |         |         |         |         |         |         |         |  
354  |         |         |         |         |         |         |         |         |         |  
355  |         |         |         |         |         |         |         |         |         |  
356  |         |         |         |         |         |         |         |         |         |  
357  |         |         |         |         |         |         |         |         |         |  
358  |         |         |         |         |         |         |         |         |         |  
359  |         |         |         |         |         |         |         |         |         |  
360  |         |         |         |         |         |         |         |         |         |  
361  |         |         |         |         |         |         |         |         |         |  
362  |         |         |         |         |         |         |         |         |         |  
363  |         |         |         |         |         |         |         |         |         |  
364  |         |         |         |         |         |         |         |         |         |  
365  |         |         |         |         |         |         |         |         |         |  
366  |         |         |         |         |         |         |         |         |         |  
367  |         |         |         |         |         |         |         |         |         |  
368  |         |         |         |         |         |         |         |         |         |  
369  |         |         |         |         |         |         |         |         |         |  
370  |         |         |         |         |         |         |         |         |         |  
371  |         |         |         |         |         |         |         |         |         |  
372  |         |         |         |         |         |         |         |         |         |  
373  |         |         |         |         |         |         |         |         |         |  
374  |         |         |         |         |         |         |         |         |         |  
375  |         |         |         |         |         |         |         |         |         |  
376  |         |         |         |         |         |         |         |         |         |  
377  |         |         |         |         |         |         |         |         |         |  
378  |         |         |         |         |         |         |         |         |         |  
379  |         |         |         |         |         |         |         |         |         |  
380  |         |         |         |         |         |         |         |         |         |  
381  |         |         |         |         |         |         |         |         |         |  
382  |         |         |         |         |         |         |         |         |         |  
383  |         |         |         |         |         |         |         |         |         |  
384  |         |         |         |         |         |         |         |         |         |  
385  |         |         |         |         |         |         |         |         |         |  
386  |         |         |         |         |         |         |         |         |         |  
387  |         |         |         |         |         |         |         |         |         |  
388  |         |         |         |         |         |         |         |         |         |  
389  |         |         |         |         |         |         |         |         |         |  
390  |         |         |         |         |         |         |         |         |         |  
391  |         |         |         |         |         |         |         |         |         |  
392  |         |         |         |         |         |         |         |         |         |  
393  |         |         |         |         |         |         |         |         |         |  
394  |         |         |         |         |         |         |         |         |         |  
395  |         |         |         |         |         |         |         |         |         |  
396  |         |         |         |         |         |         |         |         |         |  
397  |         |         |         |         |         |         |         |         |         |  
398  |         |         |         |         |         |         |         |         |         |  
399  |         |         |         |         |         |         |         |         |         |  
400  |         |         |         |         |         |         |         |         |         |  
401  |         |         |         |         |         |         |         |         |         |  
402  |         |         |         |         |         |         |         |         |         |  
403  |         |         |         |         |         |         |         |         |         |  
404  |         |         |         |         |         |         |         |         |         |  
405  |         |         |         |         |         |         |         |         |         |  
406  |         |         |         |         |         |         |         |         |         |  
407  |         |         |         |         |         |         |         |         |         |  
408  |         |         |         |         |         |         |         |         |         |  
409  |         |         |         |         |         |         |         |         |         |  
410  |         |         |         |         |         |         |         |         |         |  
411  |         |         |         |         |         |         |         |         |         |  
412  |         |         |         |         |         |         |         |         |         |  
413  |         |         |         |         |         |         |         |         |         |  
414  |         |         |         |         |         |         |         |         |         |  
415  |         |         |         |         |         |         |         |         |         |  
416  |         |         |         |         |         |         |         |         |         |  
417  |         |         |         |         |         |         |         |         |         |  
418  |         |         |         |         |         |         |         |         |         |  
419  |         |         |         |         |         |         |         |         |         |  
420  |         |         |         |         |         |         |         |         |         |  
421  |         |         |         |         |         |         |         |         |         |  
422  |         |         |         |         |         |         |         |         |         |  
423  |         |         |         |         |         |         |         |         |         |  
424  |         |         |         |         |         |         |         |         |         |  
425  |         |         |         |         |         |         |         |         |         |  
426  |         |         |         |         |         |         |         |         |         |  
427  |         |         |         |         |         |         |         |         |         |  
428  |         |         |         |         |         |         |         |         |         |  
429  |         |         |         |         |         |         |         |         |         |  
430  |         |         |         |         |         |         |         |         |         |  
431  |         |         |         |         |         |         |         |         |         |  
432  |         |         |         |         |         |         |         |         |         |  
433  |         |         |         |         |         |         |         |         |         |  
434  |         |         |         |         |         |         |         |         |         |  
435  |         |         |         |         |         |         |         |         |         |  
436  |         |         |         |         |         |         |         |         |         |  
437  |         |         |         |         |         |         |         |         |         |  
438  |         |         |         |         |         |         |         |         |         |  
439  |         |         |         |         |         |         |         |         |         |  
440  |         |         |         |         |         |         |         |         |         |  
441  |         |         |         |         |         |         |         |         |         |  
442  |         |         |         |         |         |         |         |         |         |  
443  |         |         |         |         |         |         |         |         |         |  
444  |         |         |         |         |         |         |         |         |         |  
445  |         |         |         |         |         |         |         |         |         |  
446  |         |         |         |         |         |         |         |         |         |  
447  |         |         |         |         |         |         |         |         |         |  
448  |         |         |         |         |         |         |         |         |         |  
449  |         |         |         |         |         |         |         |         |         |  
450  |         |         |         |         |         |         |         |         |         |  
451  |         |         |         |         |         |         |         |         |         |  
452  |         |         |         |         |         |         |         |         |         |  
453  |         |         |         |         |         |         |         |         |         |  
454  |         |         |         |         |         |         |         |         |         |  
455  |         |         |         |         |         |         |         |         |         |  
456  |         |         |         |         |         |         |         |         |         |  
457  |         |         |         |         |         |         |         |         |         |  
458  |         |         |         |         |         |         |         |         |         |  
459  |         |         |         |         |         |         |         |         |         |  
460  |         |         |         |         |         |         |         |         |         |  
461  |         |         |         |         |         |         |         |         |         |  
462  |         |         |         |         |         |         |         |         |         |  
463  |         |         |         |         |         |         |         |         |         |  
464  |         |         |         |         |         |         |         |         |         |  
465  |         |         |         |         |         |         |         |         |         |  
466  |         |         |         |         |         |         |         |         |         |  
467  |         |         |         |         |         |         |         |         |         |  
468  |         |         |         |         |         |         |         |         |         |  
469  |         |         |         |         |         |         |         |         |         |  
470  |         |         |         |         |         |         |         |         |         |  
471  |         |         |         |         |         |         |         |         |         |  
472  |         |         |         |         |         |         |         |         |         |  
473  |         |         |         |         |         |         |         |         |         |  
474  |         |         |         |         |         |         |         |         |         |  
475  |         |         |         |         |         |         |         |         |         |  
476  |         |         |         |         |         |         |         |         |         |  
477  |         |         |         |         |         |         |         |         |         |  
478  |         |         |         |         |         |         |         |         |         |  
479  |         |         |         |         |         |         |         |         |         |  
480  |         |         |         |         |         |         |         |         |         |  
481  |         |         |         |         |         |         |         |         |         |  
482  |         |         |         |         |         |         |         |         |         |  
483  |         |         |         |         |         |         |         |         |         |  
484  |         |         |         |         |         |         |         |         |         |  
485  |         |         |         |         |         |         |         |         |         |  
486  |         |         |         |         |         |         |         |         |         |  
487  |         |         |         |         |         |         |         |         |         |  
488  |         |         |         |         |         |         |         |         |         |  
489  |         |         |         |         |         |         |         |         |         |  
490  |         |         |         |         |         |         |         |         |         |  
491  |         |         |         |         |         |         |         |         |         |  
492  |         |         |         |         |         |         |         |         |         |  
493  |         |         |         |         |         |         |         |         |         |  
494  |         |         |         |         |         |         |         |         |         |  
495  |         |         |         |         |         |         |         |         |         |  
496  |         |         |         |         |         |         |         |         |         |  
497  |         |         |         |         |         |         |         |         |         |  
498  |         |         |         |         |         |         |         |         |         |  
499  |         |         |         |         |         |         |         |         |         |  
500  |         |         |         |         |         |         |         |         |         |  
501  |         |         |         |         |         |         |         |         |         |  
502  |         |         |         |         |         |         |         |         |         |  
503  |         |         |         |         |         |         |         |         |         |  
504  |         |         |         |         |         |         |         |         |         |  
505  |         |         |         |         |         |         |         |         |         |  
506  |         |         |         |         |         |         |         |         |         |  
507  |         |         |         |         |         |         |         |         |         |  
508  |         |         |         |         |         |         |         |         |         |  
509  |         |         |         |         |         |         |         |         |         |  
510  |         |         |         |         |         |         |         |         |         |  
511  |         |         |         |         |         |         |         |         |         |  
512  |         |         |         |         |         |         |         |         |         |  
513  |         |         |         |         |         |         |         |         |         |  
514  |         |         |         |         |         |         |         |         |         |  
515  |         |         |         |         |         |         |         |         |         |  
516  |         |         |         |         |         |         |         |         |         |  
517  |         |         |         |         |         |         |         |         |         |  
518  |         |         |         |         |         |         |         |         |         |  
519  |         |         |         |         |         |         |         |         |         |  
520  |         |         |         |         |         |         |         |         |         |  
521  |         |         |         |         |         |         |         |         |         |  
522  |         |         |         |         |         |         |         |         |         |  
523  |         |         |         |         |         |         |         |         |         |  
524  |         |         |         |         |         |         |         |         |         |  
525  |         |         |         |         |         |         |         |         |         |  
526  |         |         |         |         |         |         |         |         |         |  
527  |         |         |         |         |         |         |         |         |         |  
528  |         |         |         |         |         |         |         |         |         |  
529  |         |         |         |         |         |         |         |         |         |  
530  |         |         |         |         |         |         |         |         |         |  
531  |         |         |         |         |         |         |         |         |         |  
532  |         |         |         |         |         |         |         |         |         |  
533  |         |         |         |         |         |         |         |         |         |  
534  |         |         |         |         |         |         |         |         |         |  
535  |         |         |         |         |         |         |         |         |         |  
536  |         |         |         |         |         |         |         |         |         |  
537  |         |         |         |         |         |         |         |         |         |  
538  |         |         |         |         |         |         |         |         |         |  
539  |         |         |         |         |         |         |         |         |         |  
540  |         |         |         |         |         |         |         |         |         |  
541  |         |         |         |         |         |         |         |         |         |  
542  |         |         |         |         |         |         |         |         |         |  
543  |         |         |         |         |         |         |         |         |         |  
544  |         |         |         |         |         |         |         |         |         |  
545  |         |         |         |         |         |         |         |         |         |  
546  |         |         |         |         |         |         |         |         |         |  
547  |         |         |         |         |         |         |         |         |         |  
548  |         |         |         |         |         |         |         |         |         |  
549  |         |         |         |         |         |         |         |         |         |  
550  |         |         |         |         |         |         |         |         |         |  
551  |         |         |         |         |         |         |         |         |         |  
552  |         |         |         |         |         |         |         |         |         |  
553  |         |         |         |         |         |         |         |         |         |  
554  |         |         |         |         |         |         |         |         |         |  
555  |         |         |         |         |         |         |         |         |         |  
556  |         |         |         |         |         |         |         |         |         |  
557  |         |         |         |         |         |         |         |         |         |  
558  |         |         |         |         |         |         |         |         |         |  
559  |         |         |         |         |         |         |         |         |         |  
560  |         |         |         |         |         |         |         |         |         |  
561  |         |         |         |         |         |         |         |         |         |  
562  |         |         |         |         |         |         |         |         |         |  
563  |         |         |         |         |         |         |         |         |         |  
564  |         |         |         |         |         |         |         |         |         |  
565  |         |         |         |         |         |         |         |         |         |  
566  |         |         |         |         |         |         |         |         |         |  
567  |         |         |         |         |         |         |         |         |         |  
568  |         |         |         |         |         |         |         |         |         |  
569  |         |         |         |         |         |         |         |         |         |  
570  |         |         |         |         |         |         |         |         |         |  
571  |         |         |         |         |         |         |         |         |         |  
572  |         |         |         |         |         |         |         |         |         |  
573  |         |         |         |         |         |         |         |         |         |  
574  |         |         |         |         |         |         |         |         |         |
```



## 2.初始化设置密码。

```
97
98 void cipher_init(u32 key)
99 {
100
101     cipher_file.cipher_code[0] = ((u8 *)&key)[3];
102     cipher_file.cipher_code[1] = ((u8 *)&key)[2];
103     cipher_file.cipher_code[2] = ((u8 *)&key)[1];
104     cipher_file.cipher_code[3] = ((u8 *)&key)[0];
105
106 }
```

## 3.在打开文件的时候对比后缀名判断是不是加密文件，如果是加密文件则标志置一。

```
72 void cipher_ctl(u8 ctl)
73 {
74     cipher_file.cipher_enable = ctl;
75     r_printf("cipher_flag:%d ",ctl);
76 }
77
78 void cipher_file_check(void *name){
79     u8 *name_temp = name;
80     u8 i;
81     r_printf("cipher_file_check:%s ",name_temp);
82     put_buf(name_temp,12);
83     cipher_ctl(0);
84     for(i=0;i<9;i++){
85         if(name_temp[i]=='.'){
86             if((name_temp[i+1]== 'S') &&
87                (name_temp[i+2]== 'M') &&
88                (name_temp[i+3]== 'P'))
89             {
90                 cipher_ctl(1);
91             }
92         }
93     }
94 }
```

## 4.重写文件读取接口，增加对读出来的数据进行解密。

```
149
150 const struct if_decoder_io mp3_st_dec_io0 = {
151     &dec_mp3_st_hld, //input跟output函数的第一个参数，解码器不
152     做处理，直接回传，可以为NULL
153     #if CRYPTO_EN
154         crypto_input,
155     #else
156         mp_input,
157     #endif
158     mp_output,
159 };
```

```
105
106     const u8 index_tab[8] = {3,2,1,0,3,2,1,0};
107     int crypto_input(void *priv, u32 addr, void *buf, int len){
108         u8 temp;
109         u16 i;
110         u8 *buf_temp = buf;
111         dec_obj *obj = priv;
112         int rlen = 0;
113         vfs_seek(obj->p_file,addr,SEEK_SET);
114         rlen = vfs_read(obj->p_file,buf,len);
115         if(!cipher_file.cipher_enable)
116         {
117             // log_info("addr:%d",addr);
118         }else {
119             temp = addr%4;
120             if(temp != 0){
121                 putchar('X');
122             }
123         #if 1
124             if(rlen%4){
125                 putchar('x');
126             }
127             for(i = 0; i<((rlen/4));i++)
128             {
129
130                 buf_temp[3 + i*4] ^= cipher_file.cipher_code[index_tab
131 [temp+3]];
132                 buf_temp[2 + i*4] ^= cipher_file.cipher_code[index_tab
133 [temp+2]];
134                 buf_temp[1 + i*4] ^= cipher_file.cipher_code[index_tab
135 [temp+1]];
136                 buf_temp[0 + i*4] ^= cipher_file.cipher_code[index_tab
137 [temp]];
138             }
139         }
140     }
141     #endif
142     return rlen;
143 }
```