

① 调整(初次)  $\text{flag\_landing} = 0$   
 ~~$\text{flag\_adjust} = 0$~~

② 下降  
 $\text{flag\_landing} = 1$   
 ~~$\text{flag\_adjust} = 0$~~

③ 调整(非初次)  
 $\text{flag\_landing} = 1$   
 ~~$\text{flag\_adjust} = 1$~~

④ 直接下降

1: 调整(初次)

$\text{flag\_landing} = 0$

~~$\text{flag\_landing} = 0$~~   
 ~~$\text{flag\_adjust}$~~

2: 下降且调整

$\text{flag\_landing} = 1$

$\text{flag\_adjust} = 1$

3: 下降

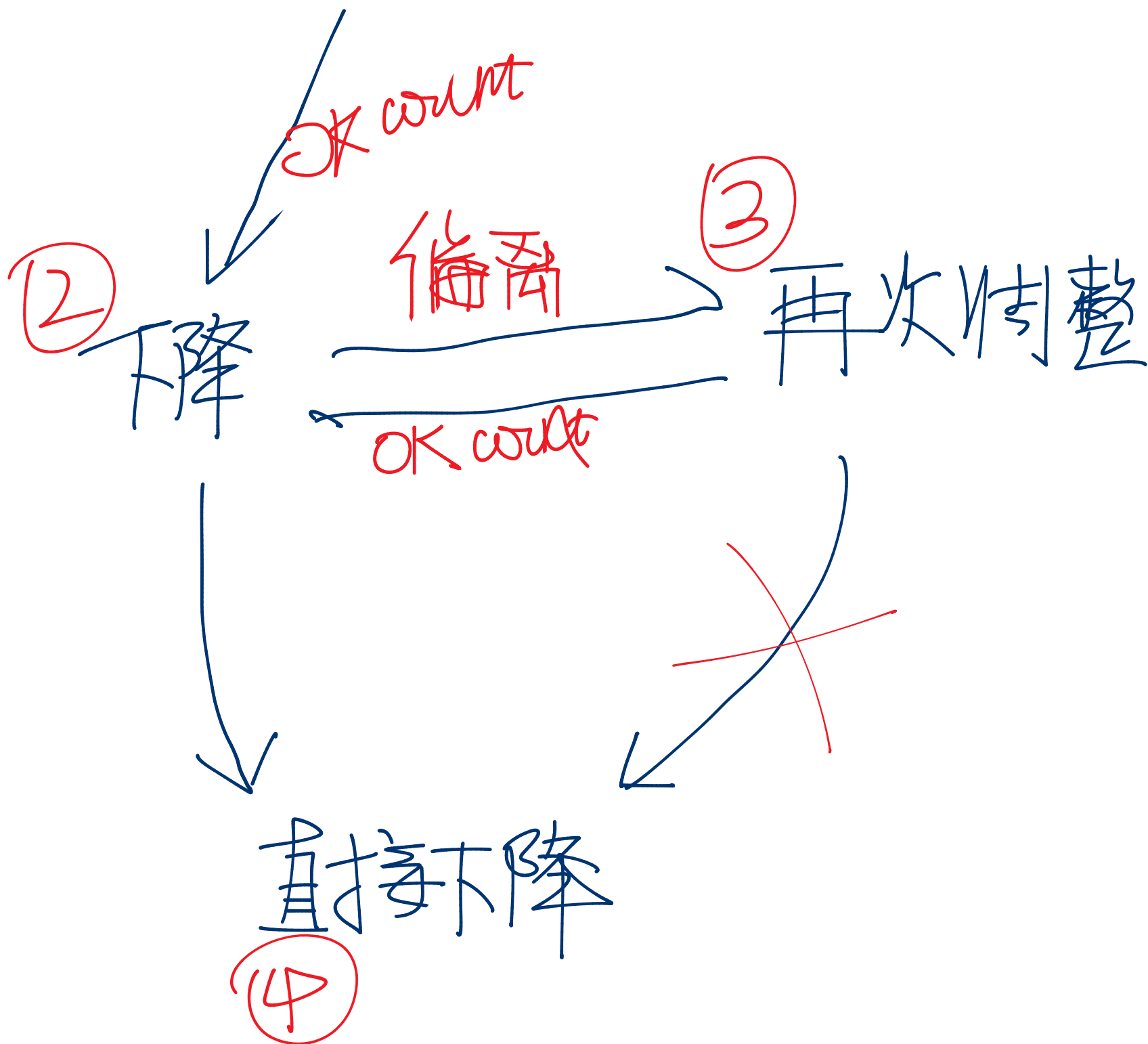
$\text{flag\_landing} = 1$

$\text{flag\_adjust} = 0$

~~20~~  
50



① 初次调整





```

326 if (lastboxfound){
327     flag_found = 1;
328     fprintf(bb_file, "%d,%d,%d,%d,%f\n", lastbox.x, lastbox.y, lastbox.br(), lastbox.br(), lastbox.conf);
329     //fprintf(testfile, "dx=%d,dy=%d\n", lastbox.x-X_CENTER, lastbox.y-Y_CENTER);
330     dx=(lastbox.x + int((lastbox.width/2) - X_CENTER)/2);
331     dy=(lastbox.y+ int((lastbox.height/2) - Y_CENTER)/2);
332     printf("data dx=%d, dy=%d, boxwidth=%d, boxheight=%d\n", dx, dy, lastbox.width, lastbox.height);
333     pts_history.push_back(Point2f((float)(lastbox.x+lastbox.width/2), (float)lastbox.y+lastbox.height/2));
334     int tmp_gas = abs(dy);
335     int tmp_dir = abs(dx);
336     getGasValue(-dy);
337     getDirValue(dx);
338     if (tmp_gas > 128){
339         tmp_gas = 128;
340     }
341     if (tmp_dir > 128){
342         tmp_dir = 128;
343     }
344     printf("data [gas]abs(dy)=%d,[dir]abs(dx)=%d\n", tmp_gas, tmp_dir);
345     //现在tmp_dir和tmp_gas都为dx或dy的绝对值
346     if (tmp_dir < 15 && tmp_gas < 15){ //目标在中心
347         if (fly_status == 1) {
348             ok_count += 1;
349             if(ok_count >= 50){ // 1->2
350                 ok_count = 0;
351                 fly_status = 2;
352                 //处于最开始的搜寻状态, 则转为降落调整状态,
353                 //并记录开始下降时的目标大小
354                 landing_width = lastbox.width;
355                 landing_height = lastbox.height;
356                 printf("data [状态改变:1->2]\n");
357                 printf("data [对准目标, 开始下降中调整]\n");
358                 printf("data [对准目标, 开始下降中调整]\n");
359                 fprintf(testfile, "data [状态改变:1->2]\n");
360                 fprintf(testfile, "data [对准目标, 开始下降中调整]\n");
361             }
362         }
363     } else{ //目标没有在中心
364         ok_count = 0;
365     }
366     if (fly_status == 2){
367         if (/*adjust_k > ADJ_HIGH && adjust_k < ADJ_LOW &&*/ lastbox.width < 150 && lastbox.height < 150) {
368             //dx和dy的绝对值任意一个大于当前框的边长, 且在可调整高度区间内, 则开始调整
369             adjust_k = (float)landing_width/lastbox.width;
370             printf("data 状态2 : 调整前gasValue = %d\n", gasValue);
371             gasValue = (int)(adjust_k * gasValue);
372             dirValue = (int)(adjust_k * dirValue);
373             printf("data 状态2 : 调整后gasValue = %d\n", gasValue);
374         } else{
375             printf("data [状态改变2->3]\n");
376             printf("data [调整结束, 直接下降]\n");
377             printf("data [调整结束, 直接下降]\n");
378             fprintf(testfile, "data [状态改变2->3]\n");
379             fprintf(testfile, "data [调整结束, 直接下降]\n");
380             fly_status = 3;
381         }
382     }
383     calControlStr();
384     sendControlStr();
385 }

```

lastbox width? cad fly \_width h

if( \_\_ && \_\_ ) {  
 okcount++, badcount=0;  
 if (count > 50) badflag=0,  
 ok flag=1,  
} else {  
 bad count++, \_\_, \_\_,  
 if( / \_\_ )  
 badflag=1  
}

switch(statusflag) {  
 case ①. okflag! -> ②

case ②.  
 badflag? -> ③  
 k > \_ -> ④  
 case ③ okflag -> ②

Can ④



```
91     last2[1]=low;
92 }
93
94 void getGasValue(int dy)
95 {
96     /*
97     if(dy>0){
98         if(dy<30){
99             gasValue=dy*4;
100         }else if(dy<60){
101             gasValue=(dy-30)*1+120;
102         }else if(dy<70){
103             gasValue=(dy-60)*0.8+150;
104         }else if(dy>=70){
105             gasValue=160;
106         }
107     }else{
108         gasValue=0;
109     }*/
110     if(dy<=-128){
111         dy = -125;
112     }
113     if(dy>=127){
114         dy = 125;
115     }
116     //*****
117     pid_ysum += dy;
118     printf("data [PID]I_ysum%d\n",pid_ysum);
119     ddy = dy - last_dy;
120     printf("data [PID]dy = %d,last_dy = %d,ddy = %d",dy , last_dy, ddy);
121     last_dy = dy;
122     dy = PID_P * dy + PID_D * ddy + PID_I * pid_ysum;
123     if(dy<=-128){
124         dy = -125;
125     }
126     if(dy>=127){
127         dy = 125;
128     }
129     //printf("[PID OK] dy = %d\n",dy);
130     if(dy<=0){
131         gasValue = - dy;
132     }
133     else{
134         gasValue = 128 + dy;
135     }
136     //*****
137     gasDeToHex(gasValue);
138 }
139 void getDirValue(int dx)
140 {
141     if(dx<=-128){
142         dx = -125;
143     }
144     if(dx>=127){
145         dx = 125;
146     }
147     //*****
148     pid_xsum += dx;
149     printf("data [PID]I_xsum%d\n",pid_xsum);
150     ddx = dx - last_dx;
```



```
177 ctrlStr[3]='\0';
178 }*/
179 void calControlStr()
180 {
181     // 0 1/2 3/4 5/6 7/8 9/10 11/12 13
182     //[ : RC xx oo xx oo xx / ]
183     //      ^ ^ ^ ^ ^ ^
184     //      gas pitch roll yaw
185     //      高低 前后 左右 偏航 校验
186     //      dir gas land?
187     /*****v4 移动到了TLD.cpp控制这些flag*****/
188     int tmp_gas = gasValue;
189     int tmp_dir = dirValue;
190     if (gasValue > 128){
191         tmp_gas -= 128;
192     }
193     if (dirValue > 128){
194         tmp_dir -= 128;
195     }
196     printf("data [gas]abs(dy)=%d,[dir]abs(dx)=%d\n", tmp_gas, tmp_dir);
197     //现在tmp_dir和tmp_gas都为dx或dy的绝对值
198     if (tmp_dir < 5 && tmp_gas < 5){
199         flag_landing = 1;
200     }
201 }
202 /*****v4 移动到了TLD.cpp控制这些flag*****/
203 ctrlStr[0]=':'; ctrlStr[1]='R';ctrlStr[2]='C';
204 for(int i=3;i<=10;i++){
205     ctrlStr[i]='0';
206 }//现在[ : RC 00 00 00 00 ]
207 if(flag_found){ //如果当前帧中目标没有丢失, 对字符串赋值, 否则保持0
208     if(fly_status == 3 || fly_status == 2){ //状态3:直接降落[: RC 00 00 00 10 ]
209         ctrlStr[9] = '0';
210         ctrlStr[10] = 'A';
211     }
212     else if (fly_status == 1 || fly_status == 2) { //状态1与状态3:降落标志是0[: RC xx xx 00 00 xx /]
213         ctrlStr[5]=dirValueChars[0];
214         ctrlStr[6]=dirValueChars[1];
215         ctrlStr[7]=gasValueChars[0];
216         ctrlStr[8]=gasValueChars[1];
217         //ctrlStr[9/10]不变
218     }
219 }else {
220     if(fly_status == 2){
221         ctrlStr[9] = '0';
222         ctrlStr[10] = 'A';
223     }
224 }
225 }
226 ctrlStr[11]='\0';
227 callLast2(ctrlStr);
228 ctrlStr[11]=last2[0];
229 ctrlStr[12]=last2[1];
230 ctrlStr[13]='/';
231 }
232
233
234 void senderInit(){
235     fd = open("/dev/ttyUSB0", O_RDWR);
236     if(fd < 0){
```