MP3 Player

Date: March 16, 2020
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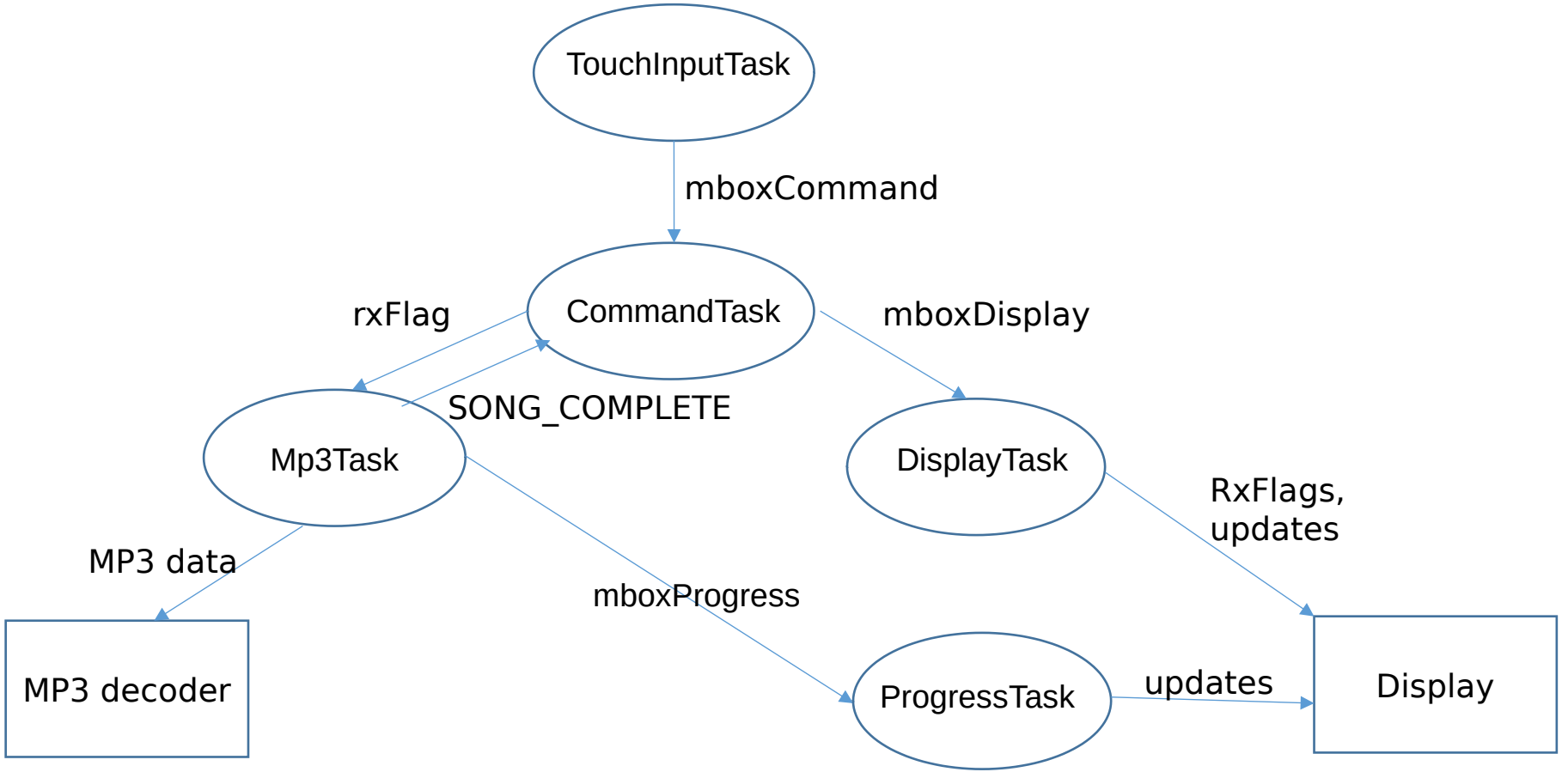
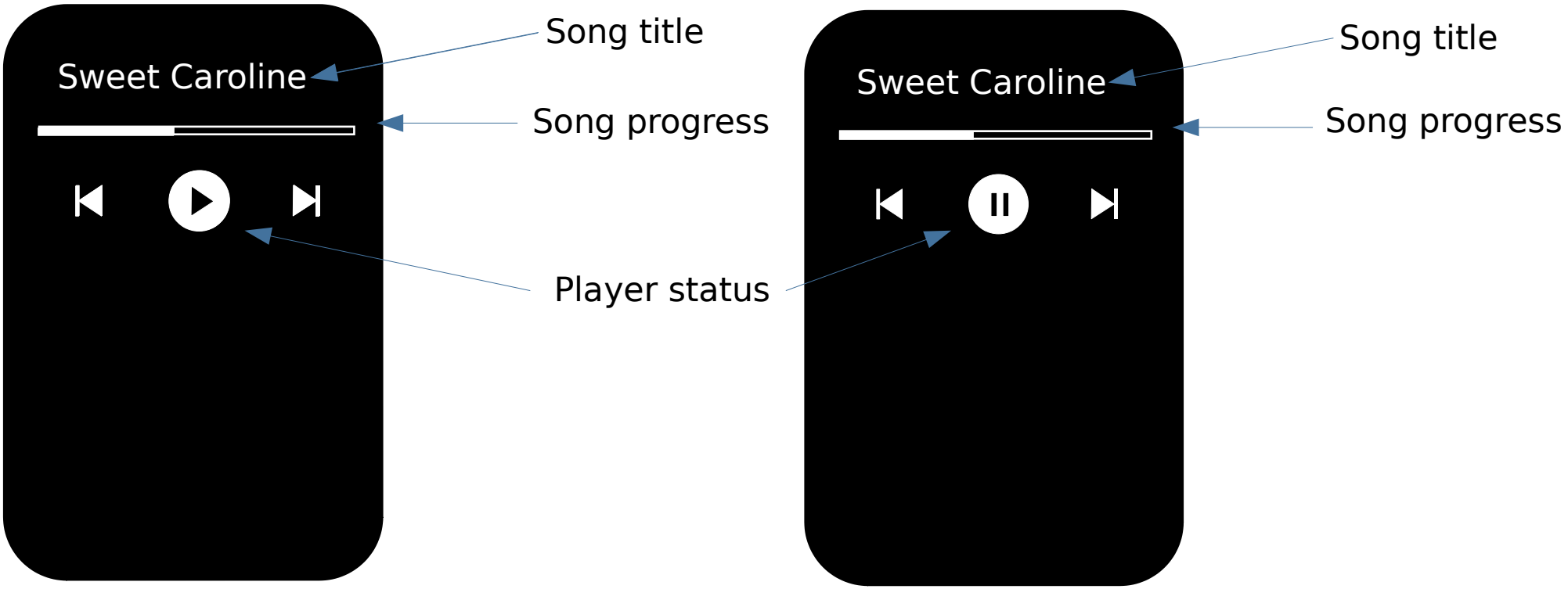
Architecture Solution



Enum CommandEnum

```
typedef enum {
    INPUTCOMMAND_NONE,
    INPUTCOMMAND_NEXTSONG,
    INPUTCOMMAND_PLAY,
    INPUTCOMMAND_PREVSONG,
    SONG_COMPLETE,
} CommandEnum;

// Task prototypes
void CommandTask(void* pdata);     // priority 5
void TouchInputTask(void* pdata);    // priority 6
void Mp3Task(void* pdata);         // priority 7
void TouchInput(void* pdata);    // priority 8
void DisplayTask(void* pdata);     // priority 9

// OS Events
mboxCommand = OSMboxCreate((void*)NULL);
mboxProgress = OSMboxCreate((void*)NULL);
mboxDisplay = OSMboxCreate((void*)NULL);
rxFlags = OSFlagCreate((OS_FLAGS)0, &err);
```

Display


Sweet Caroline
Song title
Song progress
Player status
Sweet Caroline
Song title
Song progress

Struct Grid

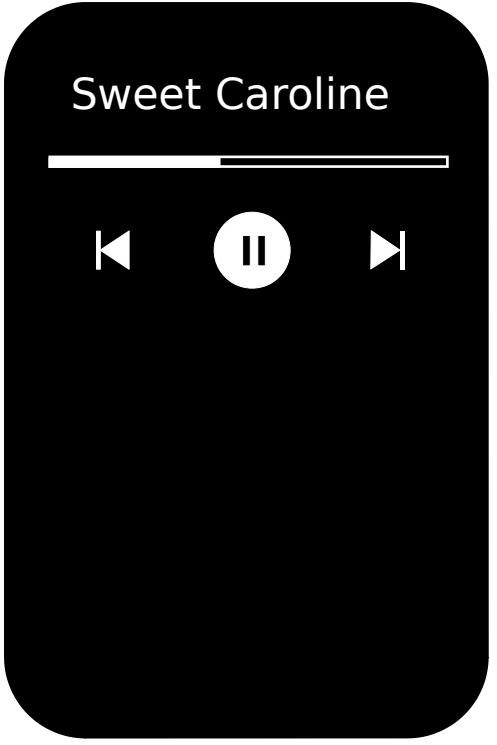
```
// DEFINE LOCATIONS FOR INPUTS
typedef struct{
    int16_t X, Y;
} Point;


typedef struct{
    Point Title;        // Song Title
    Point Progress;     // Song Progress
    Point TL, TM, TR;   // Button Layout
} Grid;
static Grid grid;


// Define Grid; (X,Y) is middle of container
grid.Title.X    = 120; grid.Title.Y    =  30;
grid.Progress.X = 120; grid.Progress.Y =  80;
grid.TL.X       =  50; grid.TL.Y       = 120;
grid.TM.X       = 120; grid.TM.Y       = 120;
grid.TR.X       = 190; grid.TR.Y       = 120;
```

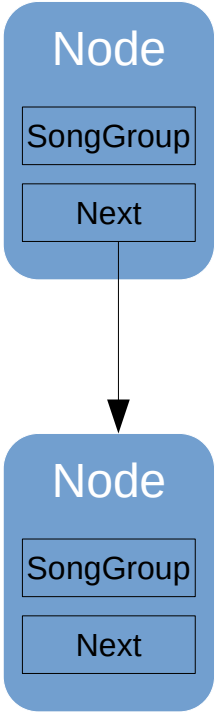
Display Helper Functions

```
// Useful functions
void DrawTitle(char *title);
void DrawProgress(int8_t percentage);
void ResetProgress(void);
void TogglePlayBtn(void);
void DrawNextBtn(void);
void DrawPrevBtn(void);
void DefineBtns(Adafruit_GFX_Button *buttonCtrl, int16_t x, int16_t y, CommandEnum CMD);
```

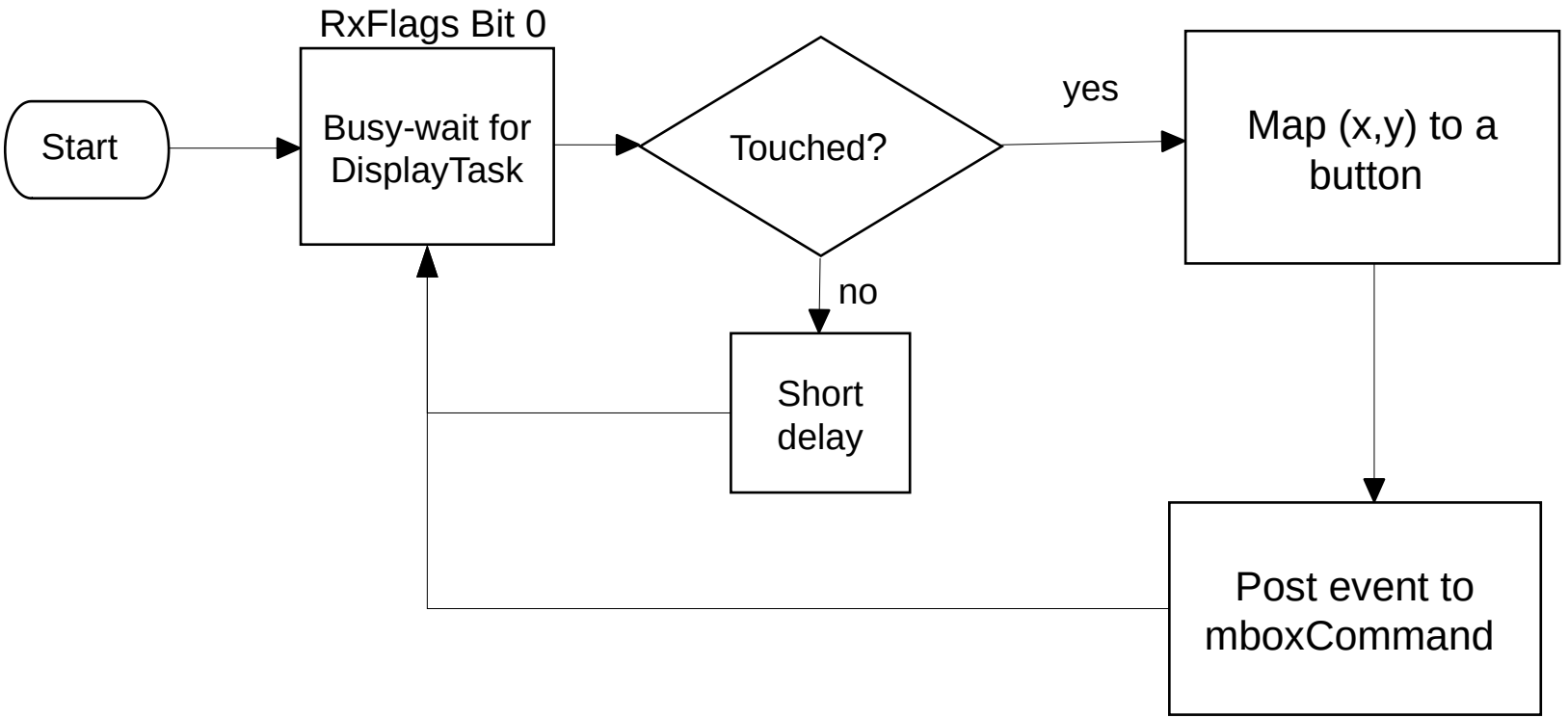
Struct SongGroup & Node

```
struct SongGroup{
    char *title;
    INT32U size;
    INT32U pos;
    INT8U *pStart;
    INT8U *pStream;
};

struct Node {
    SongGroup data;
    Node* next;
};

struct SongGroup group0;
struct Node *curNode;

group0.title = "Train Crossing";
group0.size = sizeof(Train_Crossing);
group0.pos = 0;
group0.pStart = (INT8U*)Train_Crossing;
group0.pStream = group0.pStart;
node0.data = group0;
node0.next = NULL;

curNode = &node0;
```

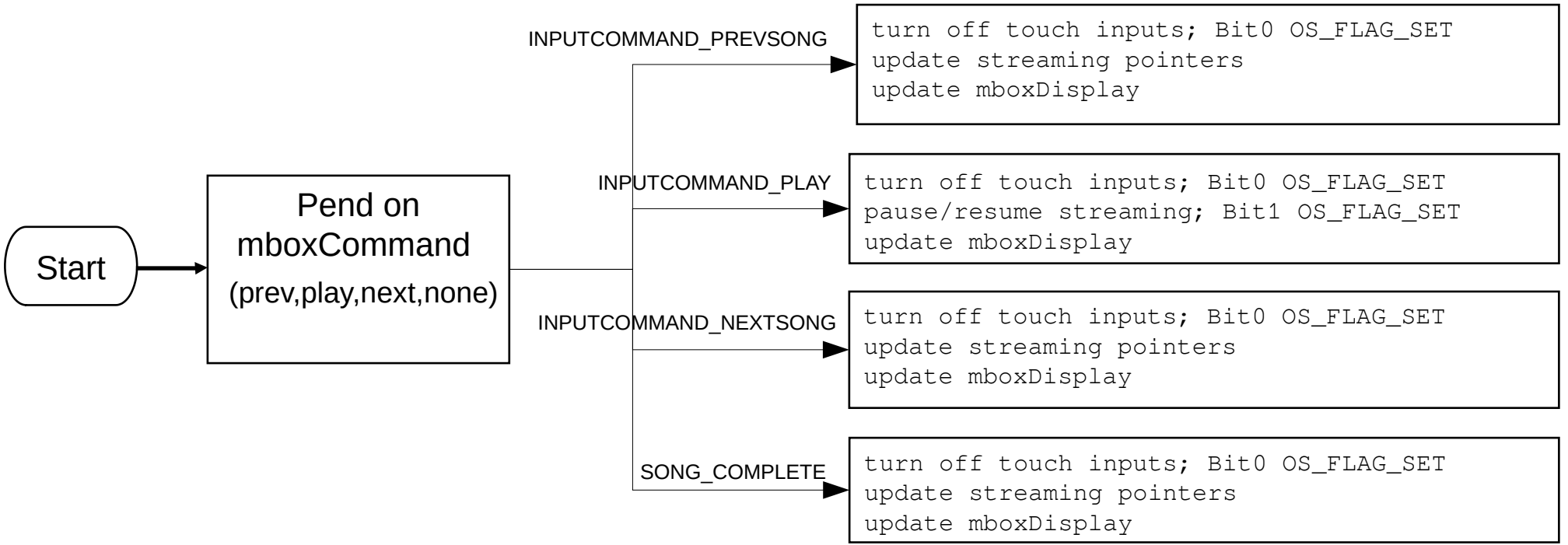




TouchInputTask

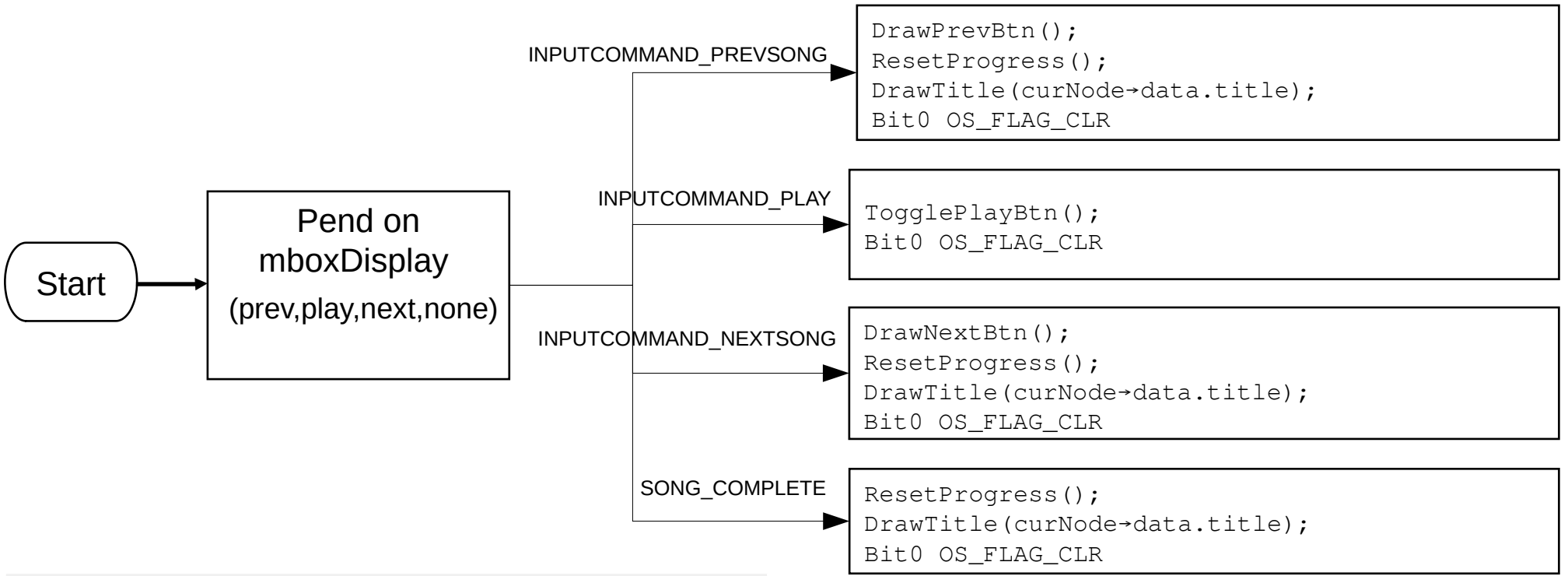


CommandTask




```
// update streaming pointers
curNode->data.pos = 0;
curNode->data.pStream = curNode->data.pStart;
curNode = curNode->next;
```

DisplayTask




```
// update streaming pointers
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```
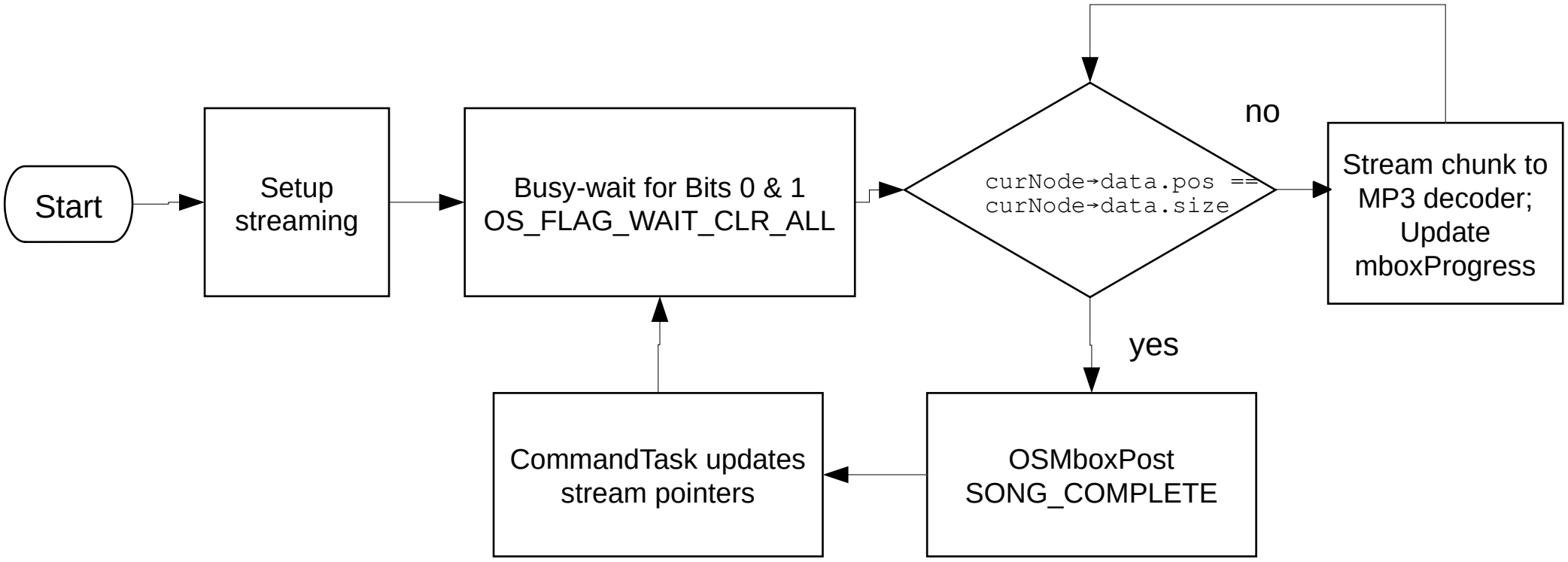

Mp3Task




```
struct Node* curNode;
curNode = &node0;
Mp3Stream(hMp3, &curNode, mboxProgress, rxFlags);
```

Demo

Thank you!