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// DCC Function Decoder
// Author: Ruud Boer - September 2015
// This sketch turns an ATtiny USB board into a DCC function decoder for F0 - F12
// Output pins used: 3-19 (14-19 = A0-A5)
// The DCC signal is optically separated and fed to pin 2 (=Interrupt 0).
// Optocoupler schematics: www.rudysmodelrailway.wordpress.com/software
// Many thanks to www.mynabay.com for publishing their DCC monitor and -decoder
code.

// IMPORTANT: GOTO lines 15 - 28 to configure some data!

int decoderAddress = 1830; // This is the decoder address, change into the number
you want.

#define F0_pin 0 // Define the output pin for every Function number in use
#define F1_pin 0 // Available pin numbers: 0,1,3,4,5
#define F2_pin 0
#define F3_pin 0
#define F4_pin 0
#define F5_pin 0
#define F6_pin 0
#define F7_pin 0
#define F8_pin 0
#define F9_pin 0
#define F10_pin 0
#define F11_pin 0
#define F12_pin 1
/* F13-F28 commented out
#define F13_pin 0
#define F14_pin 0
#define F15_pin 0
#define F16_pin 0
#define F17_pin 0
#define F18_pin 0
#define F19_pin 0
#define F20_pin 0
#define F21_pin 0
#define F22_pin 0
#define F23_pin 0
#define F24_pin 0
*/
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#include <DCC_Decoder.h> // Comment for 123d Test
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#define kDCC_INTERRUPT 0

byte Func[4]; //0=L4321, 1=8765, 2=CBA9, 3=F20-F13, 4=F28-F21
byte instrByte1;
int Address;

boolean RawPacket_Handler(byte pktByteCount, byte* dccPacket) {
    Address=0;
    if (!bitRead(dccPacket[0],7)) { //bit7=0 -> Loc Decoder Short Address
        Address = dccPacket[0];
        instrByte1 = dccPacket[1];
    }
    else if (bitRead(dccPacket[0],6)) { //bit7=1 AND bit6=1 -> Loc Decoder Long
Address
        Address = 256 * (dccPacket[0] & B00000111) + dccPacket[1];
        instrByte1 = dccPacket[2];
    }

    if (Address==decoderAddress) {
        byte instructionType = instrByte1>>5;
        switch (instructionType) {
            case 4: // Loc Function L-4-3-2-1
                Func[0]=instrByte1&B00011111;
                break;
            case 5: // Loc Function 8-7-6-5
                if (bitRead(instrByte1,4)) {
                    Func[1]=instrByte1&B00001111;
                }
                else { // Loc Function 12-11-10-9
                    Func[2]=instrByte1&B00001111;
                }
                break;
            /* F13-F28 commented out
            case 6: // Future Expansions
                switch (instrByte1&B00011111) {
                    case B00011110: // Loc Function F13-F20
                        Func[3]=dccPacket[pktByteCount-1];
                        break;
                    case B00011111: // Loc Function F21-F28
                        Func[4]=dccPacket[pktByteCount-1];
                        break;
                }
                break;
            */
        }

        if (Func[0]&B00010000) digitalWrite(F0_pin,HIGH); else digitalWrite(F0_pin,
LOW);
    }
}

```

