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/*
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```
SWR Meter by Glen Popiel - KW5GP
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```
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```

```
Connections for SWR RF head  
Forward connected to Analog 0  
Reflected connected to Analog 1
```

```
Nokia 5110 LCD module is connected to the following pins.
```

```
CLK   - Pin 12  
DIN   - Pin 11  
DC    - Pin 10  
CE    - Pin 9  
RST   - Pin 8
```

```
*/
```

```
#include <LCD5110_Basic.h> // Include Nokia 5110 LCD Library
```

```
LCD5110 glcd(12,11,10,8,9); // Define the LCD object
```

```
extern uint8_t SmallFont[]; // Define the LCD Font
```

```
#include <SoftwareSerial.h> // include the SoftwareSerial library so we  
can use it to talk to the Emic 2 module
```

```
#define rxPin 2 // Serial input (connects to Emic 2 SOUT)  
#define txPin 3 // Serial output (connects to Emic 2 SIN)  
#define audio_on 7 // Audio On Switch Pin
```

```
SoftwareSerial emicSerial = SoftwareSerial(rxPin, txPin); // set up a  
new serial port
```

```
#define adc_count 0.0048828125 // Volts per ADC count (0 to 5 volts, 0  
to 1023 A/D counts)
```

```
float V_Fwd, V_Ref = 0, V_SWR ; // Define the variables
```

```
void setup()
```

```
{
```

```
    // define the pin modes  
    pinMode(rxPin, INPUT);
```

```

pinMode(txPin, OUTPUT);
pinMode(audio_on, INPUT);
digitalWrite(audio_on, HIGH); // Enable pullup resistor

emicSerial.begin(9600); // set the data rate for the SoftwareSerial
port

glcd.InitLCD(60); // Initialize the Nokia 5110 Display - set the
contrast to 60
glcd.setFont(SmallFont);

// Display the Startup screen
glcd.clrScr();
glcd.print("KW5GP", CENTER, 0);
glcd.print("SWR Meter", CENTER, 8);
delay(3000);
glcd.clrScr();

emicSerial.print('\n'); // Send a CR in case the system is
already up
while (emicSerial.read() != ':'); // When the Emic 2 has initialized
and is ready, it will send a single ':' character, so wait here until we
receive it
delay(10); // Short delay
emicSerial.println("n1"); // Set voice to Voice 1
delay(500);
emicSerial.print('v'); // Set the volume to +18db
emicSerial.println("18");
emicSerial.flush(); // Flush the receive buffer

} // End Setup Loop

void loop() // Start the Main Loop
{
glcd.print("Fwd:", 0, 0); // Display the SWR information on the LCD
glcd.print("Ref:", 0, 8);
V_Fwd = analogRead(0) * adc_count; // Read the A/D converters and
convert to voltages
V_Ref = analogRead(1) * adc_count;
glcd.printNumF(V_Fwd, 7, 30, 0); // display the Forward and Reflected
voltages
glcd.printNumF(V_Ref, 7, 30, 8);

// Calculate VSWR
if (V_Fwd > V_Ref)
{
V_SWR = (V_Fwd + V_Ref) / (V_Fwd - V_Ref);
} else {
V_SWR = 0;
}

// Display the VSWR
glcd.print("SWR: ", 0, 24);

```

```

glcd.print("          ",30,24);
glcd.printNumF(V_SWR,1,30,24);
glcd.print(" : 1",56,24);

if (digitalRead(audio_on) == LOW)
{
    emicSerial.print('S');
    emicSerial.print("S W R is "); // Send the desired string to convert
to speech
    emicSerial.print(V_SWR,1);
    emicSerial.print(" to 1");
    emicSerial.print('\n');
    while (emicSerial.read() != ':'); // Wait here until the Emic 2
responds with a ":" indicating it's ready to accept the next command
}

    delay(1000);

} // End Main Loop

```