

```

1 //=====
2 //
3 // Step 42-1
4 // Clock -> LCD use Ticker
5 // Temp measure
6 // Illuminance
7 // Distance
8 //
9 //=====
10 #include "mbed.h"
11 #include "TextLCD.h"
12
13 // StarBoard Orange arrange
14 TextLCD lcd(p17, p12, p27, p28, p29, p30); // rs, e, d4-d7
15 AnalogIn ain15(p15); // Analog In P15 <= LM35D
16 AnalogIn ain16(p16); // Analog In P16 <= NJ7502L
17 AnalogIn ain18(p18); // Analog In P18 <= GP2Y0A21YK
18 PwmOut beep(p23); // JP7 (2-3)
19 Ticker tik; // recurring interrupt
20 float tmp; // ondo
21 float phTr; // Photo Transistor
22 float dms; // Distance
23 int tikFlg = 0;
24 float freq[] = {400, 800, 1200, 2400, 4800};
25
26 //=====
27 // Ticker
28 //=====
29 void attime(void)
30 {
31     tikFlg = 1;
32 }
33
34 //=====
35 // Main
36 //=====
37 int main(void)
38 {
39     lcd.cls();
40     lcd.locate(0, 0); // x, y
41
42     //=====
43     // RTC check
44     //=====
45     time_t now_time = time(NULL); // today
46     struct tm *s_tm = localtime(&now_time);
47     if(s_tm->tm_year < 117 ) // since 1900
48     { // RTC set
49         struct tm t;
50         t.tm_sec = 0; // 0-59
51         t.tm_min = 0; // 0-59
52         t.tm_hour = 10; // 0-23
53         t.tm_mday = 1; // 1-31
54         t.tm_mon = 7-1; // 0-11
55         t.tm_year = 117; // year since 1900
56
57         set_time(mktime(&t)); // Write RTC
58     }
59
60     tik.attach(&attime, 1); // 1s -> call attime
61
62     while(1)
63     {
64         if( tikFlg == 1 )
65         {
66             tikFlg = 0;

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67         now_time = time(NULL);    // today
68         s_tm = localtime(&now_time);
69         lcd.locate(0, 0);
70         //lcd.printf("%02d/%02d %02d:%02d:%02d", s_tm->tm_mon+1, s_tm->tm_mday, s_tm->tm_hour, s_tm->tm_min, s_tm->tm_sec);
71         //lcd.printf("%02d:%02d:%02d", s_tm->tm_hour, s_tm->tm_min, s_tm->tm_sec);
72
73         //-----
74         // Temp
75         //-----
76         tmp = ain15 * 330;
77         //lcd.locate(0, 1);
78         //lcd.printf("Temp=%2.1fdeg", tmp);
79         //-----
80         // Illuminance
81         //-----
82         phTr = ain16 * 10000;
83         lcd.locate(0, 1);
84         lcd.printf("T=%3.1f L=%7.2f", tmp, phTr);
85         //-----
86         // Distance
87         //-----
88         dms = 26.663 * pow((ain18 * 3.3), (-1.25));
89         lcd.locate(8, 0);
90         lcd.printf("D=%4.1f", dms);
91
92         if( dms > 50 )
93         {
94             beep.write(0.0);        //Duty
95         }
96         else if( dms > 40 )
97         {
98             beep.period(1.0/freq[0]);
99             beep.write(0.5);        //Duty
100        }
101        else if( dms > 30 )
102        {
103            beep.period(1.0/freq[1]);
104            beep.write(0.5);        //Duty
105        }
106        else if( dms > 20 )
107        {
108            beep.period(1.0/freq[2]);
109            beep.write(0.5);        //Duty
110        }
111        else if( dms > 10 )
112        {
113            beep.period(1.0/freq[3]);
114            beep.write(0.5);        //Duty
115        }
116        else
117        {
118            beep.period(1.0/freq[4]);
119            beep.write(0.5);        //Duty
120        }
121    }
122 }
123 }
124 }

```