

# Mastering Microcontrollers Helped By Arduino

## Component Lists

### Chapter 6

#### Figure 6-9

R1–R4 = 680  $\Omega$

LED1–LED16 = LED (red, green, orange, yellow)

#### Figure 6-10

R1–R4 = 680  $\Omega$

S1–S16 = pushbutton

D1–D16 = 1N4148

LED1–LED16 = LED (red, green, orange, yellow)

### Chapter 7

#### Figure 7-3

R1 = 330  $\Omega$

P1 = 10 k $\Omega$  linear

LED1 = LED (red, green, orange, yellow)

#### Figure 7-5

R1–R4 = 15 k $\Omega$

P1 = 10 k $\Omega$  linear potentiometer

Q1, Q4 = BC547 (A, B or C)

Q2, Q5 = IRF630 (Vishay Siliconix)

Q3, Q6 = IRF9630 (Vishay Siliconix)

#### Figure 7-12

R1 = 47 k $\Omega$

R2, R3 = 150 k $\Omega$

R4 = 150  $\Omega$

C1 = 47 nF

C2, C3 = 220 nF

C4 = 100 nF

IC1 = LMC6464 (Texas Instruments)

BAT1 = battery, 1.5 V, AAA

LS1 = miniature loudspeaker (scavenge from junked transistor radio)

K1/K2 = stereo 3.5 mm audio connector “mini jack” (note: K1 and K2 reference the same connector)

#### For the fork:

Metal fork

Piece of self-adhesive copper tape

Self-adhesive isolation tape

Piece of copper tubing

Stereo 3.5 mm audio plug, “mini jack”

Cable with two shielded conductors (e.g. stereo audio cable)

### Chapter 8

**Figure 8-1**

R1 = 10 k $\Omega$

R2 = 47  $\Omega$

P1 = 10 k $\Omega$  adjustable resistor (trimpot)

T1 = BC547 (A, B or C)

LCD1 = alphanumeric display with 2 lines of 16 characters (4-line by 20-character type will also work)

**Figure 8-5**

R1 = 10 k $\Omega$

R2 = 47  $\Omega$

P1 = 10 k $\Omega$  adjustable resistor (trimpot)

T1 = BC547 (A, B or C)

GPS = GPS receiver module with antenna (e.g. Mikroelektronika GPS, <http://www.mikroe.com/add-on-boards/gps/>)

LCD1 = alphanumeric display with 2 lines of 16 characters (4-line by 20-character type will also work)

**Figure 8-7**

R1 = 10 k $\Omega$

R2 = 47  $\Omega$

R3, R4 = 6.8 k $\Omega$

R5, R6 = 2.2 k $\Omega$

P1 = 10 k $\Omega$  adjustable resistor (trimpot)

D1, D2 = 3.3 V zener diode

T1 = BC547 (A, B or C)

T2, T3 = BS170

MOD2 = HP03S (Hope RF)

LCD1 = alphanumeric display with 2 lines of 16 characters (4-line by 20-character type will also work)

**Figure 8-11**

R1 = 10 k $\Omega$

R2 = 47  $\Omega$

R3, R4 = 6.8 k $\Omega$

R5, R6 = 2.2 k $\Omega$

R7 = 10 k $\Omega$

P1 = 10 k $\Omega$  adjustable resistor (trimpot)

C1 = 100 nF

D1, D2 = 3.3 V zener diode

T1 = BC547 (A, B or C)

T2, T3 = BS170

LCD1 = alphanumeric display with 2 lines of 16 characters (4-line by 20-character type will also work)

MOD2 = HP03S (Hope RF)

MOD3 = SHT11 (Sensirion)

**Chapter 9****Figure 9-2**

MOD2 = DCF77 receiver module (e.g. Conrad 641138)

**Figure 9-3**

R1 = 10 k $\Omega$

R2 = 47  $\Omega$

P1 = 10 k $\Omega$  adjustable resistor (trimpot)

T1 = BC547 (A, B or C)

LCD1 = alphanumeric display with 2 lines of 16 characters (4-line by 20-character type will also work)

MOD2 = DCF77 receiver module (e.g. Conrad 641138)

### **Figure 9-5**

(// means two resistors in parallel)

R1 = 1 M $\Omega$  // 22 k $\Omega$

R2, R5 = 3.3 k $\Omega$  // 120  $\Omega$

R3 = 3.3 M $\Omega$  // 39 k $\Omega$

R4 = 18 k $\Omega$  // 2.2 k $\Omega$

R6 = 470 k $\Omega$  // 39 k $\Omega$

R7, R8 = 10 k $\Omega$

C1–C4 = 1 nF

C5, C6 = 100 nF

IC1 = TS922 (STMicroelectronics)

### **Figure 9-6**

C1, C2 = 10  $\mu$ F 16 V

L1 = DCF77 receiver module antenna (e.g. Conrad 641138)

### **Figure 9-11**

IC1 = TSOP34836 or TSOP1736 (Vishay Semiconductors)

### **Figure 9-14**

R1 = 220  $\Omega$

LED1 = infrared LED (scavenged from a junked remote control)

### **Figure 9-15**

R1 = 220  $\Omega$

R2, R4 = 2.2 k $\Omega$

R3 = 680 k $\Omega$

C1 = 220 nF

LED1 = infrared LED (scavenged from a junked remote control)

IC1 = TSOP34836 or TSOP1736 (Vishay Semiconductors)

T1 = BC547C

MIC1 = electret microphone

## Chapter 10

### Figure 10-3

R1, R2 = 10 k $\Omega$

S1 = rotary encoder with integrated pushbutton (e.g. Alps EC12E2424407)

### Figure 10-5

R2 = 10 k $\Omega$

PH1 = photoresistor (LDR)

BUZ1 = buzzer

### Figure 10-7

R1 = 220  $\Omega$

R2 = 10 k $\Omega$

PH1 = photoresistor (LDR)

D1 = 1N4001

IC1 = DS18B20 (or DS18S20) (Maxim)

LED1 = LED red

T1 = BD139

RE1 = 12 V car relay

H1 = 5-tone car horn "La Cucaracha"

### Figure 10-9

R1 = 220  $\Omega$

C1 = 100 nF

D1 = 1N4001

IC1 = MLX90614AAA (Melexis)

LED1 = LED red

T1 = BD139

RE1 = 12 V car relay

H1 = 5-tone car horn "La Cucaracha"