Chapter 10 Experiment appliance of circuit practice

10-1 Practice purpose

10-2 Practice items

10-2-1

Experiment steps
1. 0-59 Timer and stop watch, as figure 10-1.
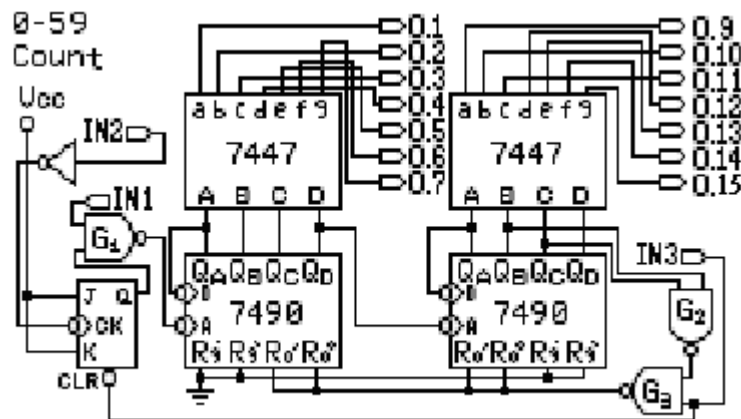

Figure 10-1

2. Input: Connect CON5 CLK 1HZ to CON1 IN1
              Connect CON7 S1 to CON1 IN2
              Connect CON7 S2 to CON1 IN3
  Output: Connect CON4 OUT1 to 7-SEGMENT CON10 LED1 a
              Connect CON4 OUT2 to 7-SEGMENT CON10 LED1 b
              Connect CON4 OUT3 to 7-SEGMENT CON10 LED1 c
              Connect CON4 OUT4 to 7-SEGMENT CON10 LED1 d
              Connect CON4 OUT5 to 7-SEGMENT CON10 LED1 e
              Connect CON4 OUT6 to 7-SEGMENT CON10 LED1 f
              Connect CON4 OUT7 to 7-SEGMENT CON10 LED1 g
              Connect CON4 OUT9 to 7-SEGMENT CON10 LED2 a
              Connect CON4 OUT10 to 7-SEGMENT CON10 LED2 b
              Connect CON4 OUT11 to 7-SEGMENT CON10 LED2 c
              Connect CON4 OUT12 to 7-SEGMENT CON10 LED2 d
              Connect CON4 OUT13 to 7-SEGMENT CON10 LED2 e
              Connect CON4 OUT14 to 7-SEGMENT CON10 LED2 f
              Connect CON4 OUT15 to 7-SEGMENT CON10 LED2 g
3. Observe the change of 7-segment display.
4. Press S1, the Timer and stop watch stops counting and the 7-segment display shows 00.
   Press S2, the Timer and stop watch starts to count, the changes are 00-01-02-….-59-00.

10-2-2

Experiment

1. Thunderbolt light circuit, as figure 10-2
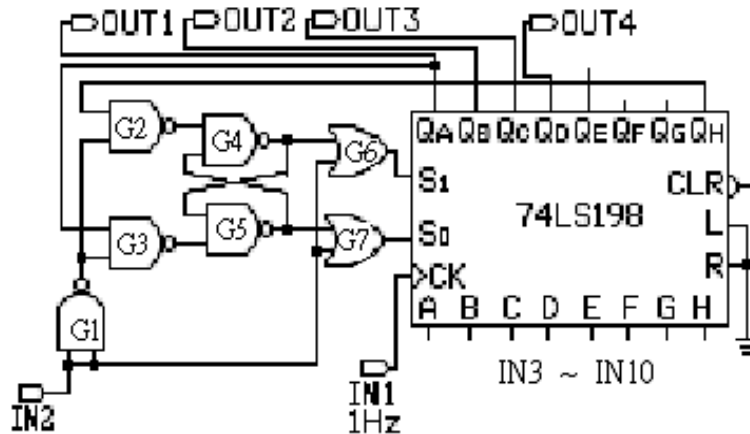

Figure 10-2

2. Input   Connect CON5 CLK 1HZ to CON1 IN1
              Connect CON7 S1 to CON1 IN2
              Connect CON7 S2 to CON1 IN3
              Connect CON7 S3 to CON1 IN4
              Connect CON7 S4 to CON1 IN5
              Connect CON7 S5 to CON1 IN6
              Connect CON7 S6 to CON1 IN7
              Connect CON7 S7 to CON1 IN8
              Connect CON7 S8 to CON1 IN9
              Connect CON7 IN10 to CON9 V_H
  Output: Connect CON4 OUT1 to LED DISPLAY CON15 Q1
              Connect CON4 OUT2 to LED DISPLAY CON15 Q2
              Connect CON4 OUT3 to LED DISPLAY CON15 Q3
              Connect CON4 OUT4 to LED DISPLAY CON15 Q4
              Connect CON4 OUT5 to LED DISPLAY CON15 Q5
              Connect CON4 OUT6 to LED DISPLAY CON15 Q6
              Connect CON4 OUT7 to LED DISPLAY CON15 Q7
              Connect CON4 OUT8 to LED DISPLAY CON15 Q8

3. Connect IN2 to SW1 and make it 1, and H1 inputs are S0 and S1.
  74198 turns to loading model, Q_A's output is A's input.
  74198 turns to loading model, Q_B's output is B's input
  74198 turns to loading model, Q_C's output is C's input
  74198 turns to loading model, Q_D's output is D's input
  74198 turns to loading model, Q_E's output is E's input
  74198 turns to loading model , Q_F's output is F's input
  74198 turns to loading model, Q_G's output is G's input

74198 turns to loading model, Q_H's output is H's input

4. Connect SW1 from 1 to 0, when $Q_H = 1$ (IN10 connect to CON9 V_H, S2=0), S=1, R=0, S1=Q=1, S0=$\overline{Q}$=0, 74198 is operated with left movement model. When Q_A 1 (S2 1 IN10 is connected to CON20 V_L), S 0, R 1, S_1=Q=0, S_0=$\overline{Q}$=1, 74198 is operated with right movement model.

5. When SW1 connect 1 to0, logic gate 1 output is HI achieving logic gate 2, 3 movement. Logic gate 2~5 are SR positive and negative gate Assume S=0,R=1,$\overline{Q}$=0,Q=1b logic gate 6,7 after output S_1=0,S_0=1,74198 is operated with right movement model.

6. Input data is controlled by A~H 8 bit, we can set any input number and press SW1 switch.

7. The operation procedure.

Input			Movement
CLK	S1 S0	CK	
1	0 0	X	Still
1	0 1		Right
1	1 0	CLK input	Left
1	1 1	⌐⌐	Input data
0	X X	X	Clear

Ps. X means don't care.

Figure 10-1 74198 Truth Table

10-2-3

Experiment steps

1. Advertisement LED circuit, as figure 10-3.
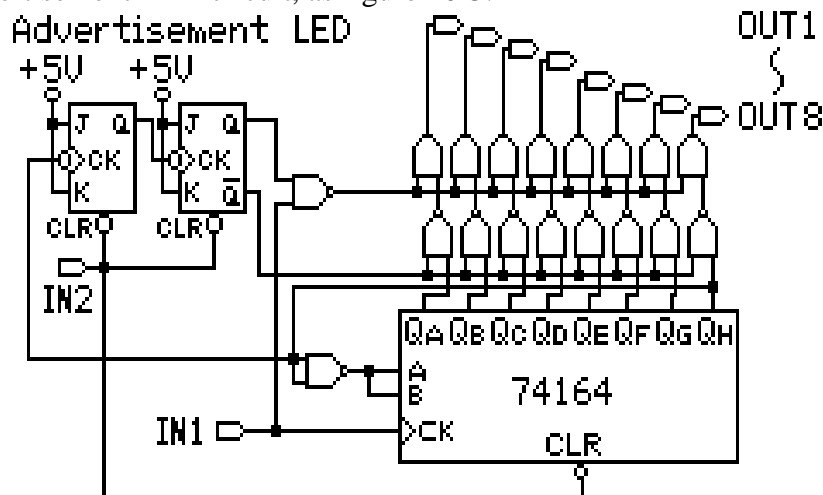

Figure 10-3

2. Input   Connect CON5 CLK 1HZ to CON1 IN1

                Connect CON7 S1 to CON1 IN2

   Output: Connect CON4 OUT1 to LED DISPLAY CON15 Q9

                Connect CON4 OUT2 to LED DISPLAY CON15 Q10

                Connect CON4 OUT3 to LED DISPLAY CON15 Q11

                Connect CON4 OUT4 to LED DISPLAY CON15 Q12

                Connect CON4 OUT5 to LED DISPLAY CON15 Q13

                Connect CON4 OUT6 to LED DISPLAY CON15 Q14

                Connect CON4 OUT7 to LED DISPLAY CON15 Q15

                Connect CON4 OUT8 to LED DISPLAY CON15 Q16

3. Press S1 after finished connecting. 0 means low logic, LED off, 1 means high logic, LED on. Observe LED changes.