

实验8：可编程计数器/定时器 8254 的使用

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实验内容

1. 了解计数脉冲来时的计数规律.
2. 构建脉冲计数器,记录脉冲数.
3. 构建可编程定时信号发生器,并记录一个时间段内其发出脉冲的个数.

程序代码

```
//1.c
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include <bios.h>
#include <ctype.h>
#include <process.h>
#include <time.h>

void main()
{
    int clk1,clk2;
    int i;
    int port_A=0x3000;
    int port_B,port_C,port_CMD;
    unsigned int b,c,a,d=0;
    port_B=0x3004;
    port_C=0x3008;
    port_CMD=port_A+12;
    outp(port_CMD,0x31);
    outp(port_CMD,0x71);
    outp(port_CMD,0xB1);
    outp(port_A,0xE8);
    outp(port_A,0x03);
    for(a=0;a<13567;a++)
    {
        for(i=0;i<(14652);i++)
            for(d=0;d<a%23+5568;d++)
                outp(port_CMD,0xC2);
        b=inp(port_A);
        c=inp(port_A);
        b=inp(port_A);
        c+=b*256;
        printf("%d\n",c);
    }
}
```

```
//2.c
#include <stdio.h>
#include <stdlib.h>
```

```
#include <conio.h>
#include <bios.h>
#include <ctype.h>
#include <process.h>

void main()
{
    int clk1,clk2;
    int i;
    int port_A = 0x3000;
    int port_B, port_C, port_CMD;
    int b1,c1,a1,d1 = 0;
    int b2,c2,a2 ,d2= 0;
    int b3,c3,a3 ,d3= 0;
    port_B = port_A+4;
    port_C = port_A+8;
    port_CMD = port_A+12;

    outp(port_CMD,0x31);
    outp(port_A,0x00);
    outp(port_A,0x00);
    outp(port_CMD,0x71);
    outp(port_B,0x00);
    outp(port_B,0x00);
    outp(port_CMD,0xB1);
    outp(port_C,0x00);
    outp(port_C,0x00);
    clk1=clock();
    do{clk2=clock();}

    while((clk2-clk1)<2);
    outp(port_CMD,0xDE);
    b1 = inp(port_A);
    c1 = inp(port_A);
    a1= c1 +b1*256;
    b2 = inp(port_A);
    c2 = inp(port_A);
    a2= c2 +b2*256;
    b3 = inp(port_A);
    c3 = inp(port_A);
    a3= c3 +b3*256;
    clk1=clock();
    do{clk2=clock();}while((clk2-clk1)<10);
    outp(port_CMD,0xDE);
    b1 = inp(port_A);
    c1 = inp(port_A);
    d1= c1 +b1*256;
    b2 = inp(port_A);
    c2 = inp(port_A);
    d2 = c2 + b2*256;
    b3 = inp(port_A);
    c3 = inp(port_A);
    d3 = c3 +b3*256;
    printf("counter1:%d\n",d1-a1);
    printf("counter2:%d\n",d2-a2);
    printf("counter3:%d\n",d3-a3);

}
```

```

//3.c
#include <stdio.h>
#include <stdlib.h>
#include <conio.h>
#include <bios.h>
#include <ctype.h>
#include <process.h>
#include <time.h>
void main()
{
    int clk1,clk2;
    int i;
    int port_A = 0x3000;
    int port_B, port_C, port_CMD;
    int b1,c1,a1,d1 = 0;
    int b2,c2,a2 ,d2= 0;
    int b3,c3,a3 ,d3= 0;
    int x;
    port_B = port_A+4;
    port_C = port_A+8;
    port_CMD = port_A+12;

    outp(port_CMD,0x36);
    outp(port_A,0x40);
    outp(port_A,0x02);

    outp(port_CMD,0x76);
    outp(port_B,0x80);
    outp(port_B,0x0C);

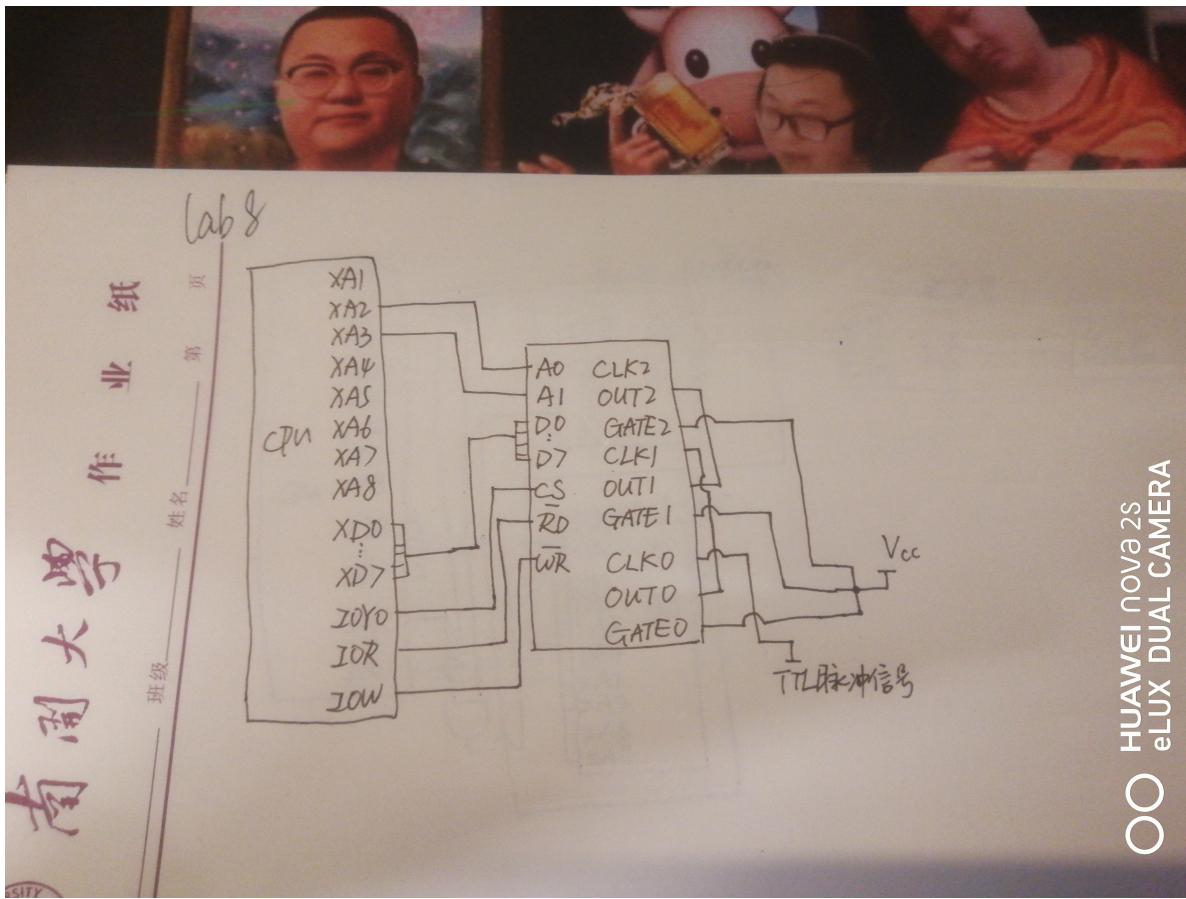
    outp(port_CMD,0xB0);
    outp(port_C,0xFF);
    outp(port_C,0xFF);
    outp(port_CMD,0xC8);
    a1=inp(port_C);
    a2=inp(port_C);
    a3=inp(port_C);
    printf("%d %d\n",a2,a3);

    clk1=clock();
    do{clk2=clock();}while((clk2-clk1)<55);
    outp(port_CMD,0xC8);
    d1=inp(port_C);
    d2=inp(port_C);
    d3=inp(port_C);
    printf("%d %d\n",d2,d3);

    x=(d2-a2)+(d3-a3)*256;
    printf("%d \n",x);
}

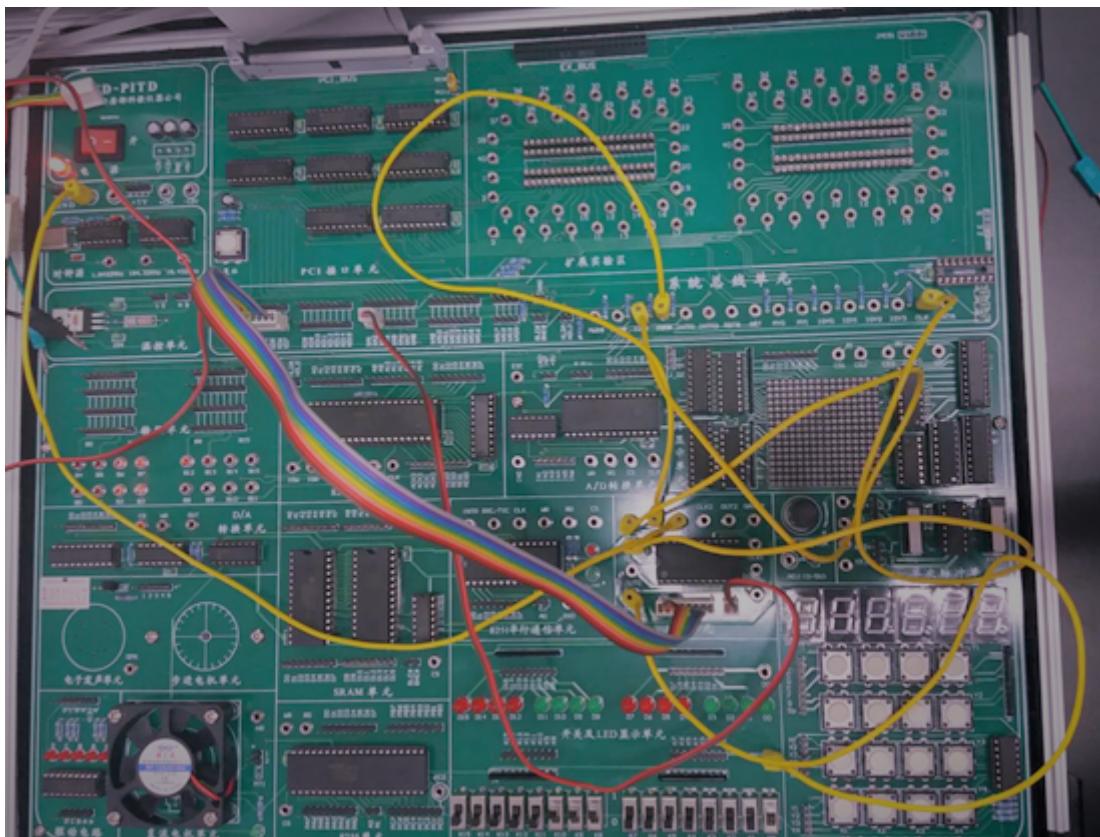
```

抽象接线图

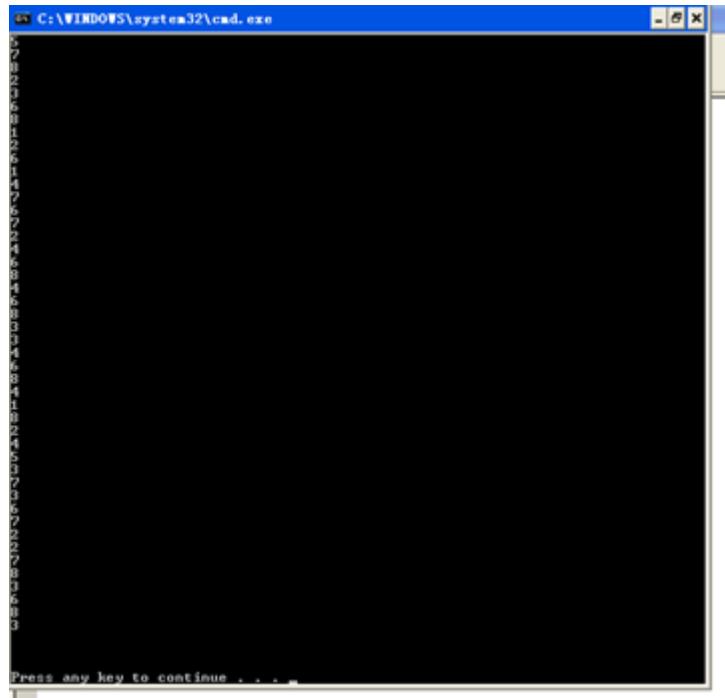


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实验连线图



1:



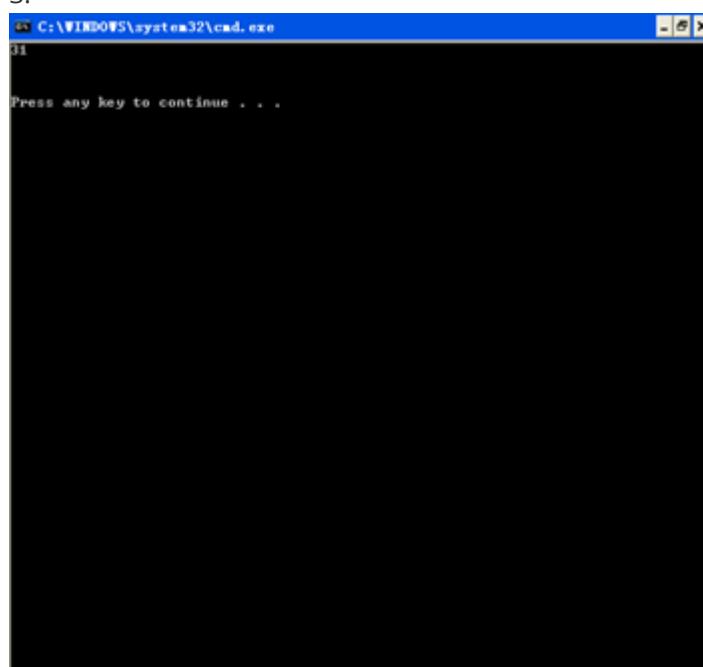
A screenshot of a Windows Command Prompt window titled "C:\WINDOWS\system32\cmd.exe". The window is entirely black, indicating no output has been displayed. At the bottom of the window, the text "Press any key to continue . . ." is visible.

2:



A screenshot of a Windows Command Prompt window titled "C:\WINDOWS\system32\cmd.exe". The window displays three lines of text: "counter1:9633", "counter2:8609", and "counter3:8353". At the bottom of the window, the text "Press any key to continue . . ." is visible.

3:



A screenshot of a Windows Command Prompt window titled "C:\WINDOWS\system32\cmd.exe". The window displays a single character "1" on the left side of the screen. At the bottom of the window, the text "Press any key to continue . . ." is visible.

