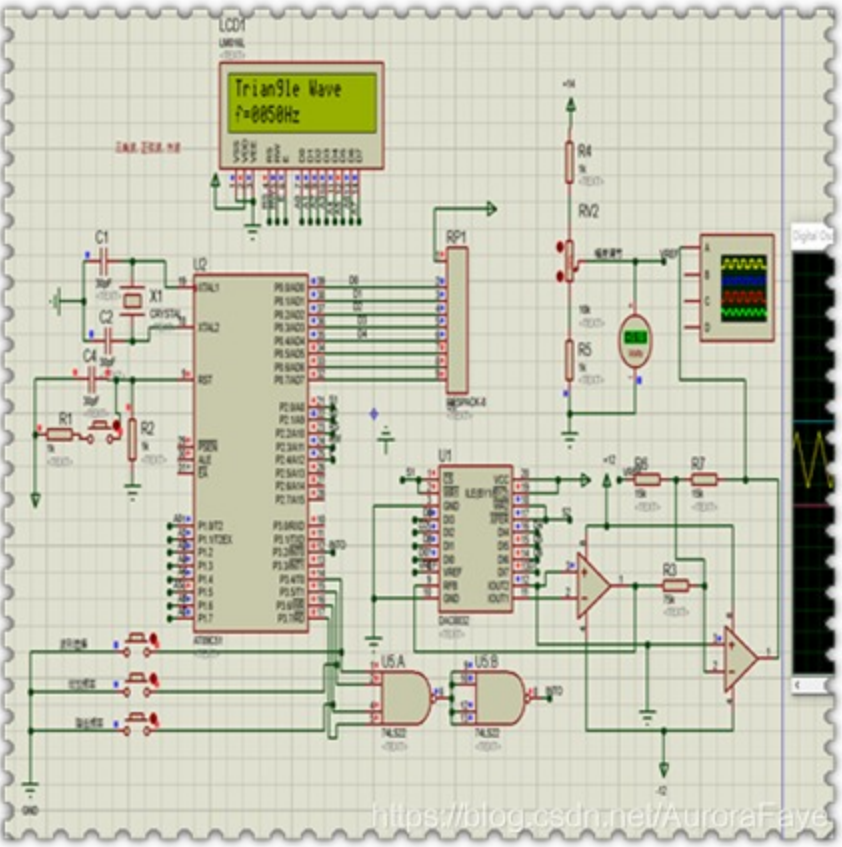




前言

随着电子测量技术与计算机技术的紧密结合，一种新的信号发生器——波形发生器应运而生。所谓波形发生器是能够产生大量的标准信号和用户定义信号，并保证高精度、高稳定性、可重复性和易操作性的电子仪器。单片机作为微型计算机的一个重要分支，有着广泛的应用范围。本文介绍的是利用89C51单片机和数模转换器件DAC0832产生所需不同信号的低频信号源，其信号幅度和频率都是可以按要求控制的。本设计核心任务是：以AT89C51为核心，结合D/A转换器和DAC0832等器件，用仿真软件设计硬件电路，用汇编语言编写驱动程序，以实现程序控制产生正弦波、三角波、方波、三种常用低频信号。可以通过按键选择波形和输入任意频率值。

关键词：AT89C51单片机；信号发生器；DAC0832

```
1      #include<reg52.h>
2      #define uchar unsigned char
3      #define uint unsigned int
4      #define DAdata P0 //DA数据端口
5      sbit DA_S1= P2^0; // 控制DAC0832的8位输入寄存器，仅当都为0时，可以输出数据(处于直通状态)，否则，输出将被锁存
6      sbit DA_S2= P2^1; // 控制DAC0832的8位DAC寄存器，仅当都为0时，可以输出数据(处于直通状态)，否则，输出将被锁存
7      sbit key= P3^2;
8      uchar wavecount; // '触点' 计数
9      uchar THtemp,TLtemp;// 传递频率的中间变量
10     uchar judge=1; // 在方波输出函数中用于简单判别作用
11     uchar waveform; // 当其为0、1、2时，分别代表三种波
12     uchar code freq_unit[3]={10,50,200}; // 三种波的频率单位
13     uchar idata wavefreq[3]={1,1,1}; // 给每种波定义一个数组单元，用于存放单位频率的个数
14     uchar code lcd_hang1[]={"Sine Wave " "Triangle Wave " "Square Wave " "Select Wave: " "press No.1 key!"
15     uchar idata lcd_hang2[16]={"f= Hz "};
16     uchar code waveTH[]={
17         0xfd,0xfe,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
18         0xfd,0xfe,0xff,0xff,0xff,0xff,0xff,0xff,0xff,0xff,
19         0xec,0xf6,0xf9,0xfb,0xfc,0xfc,0xfd,0xfd,0xfd,0xfe};
20     uchar code waveTL[]={
21         0x06,0x8a,0x10,0x4e,0x78,0x93,0xa8,0xb3,0xbe,0xc6, // 正弦波频率调整中间值
22         0xac,0xde,0x48,0x7a,0x99,0xaf,0xbb,0xc8,0xd0,0xde, // 三角波频率调整中间值
23         0x88,0x50,0x90,0x32,0x34,0xbe,0x4a,0xa3,0xe5,0x2c};
24     /*****
25     uchar code triangle_tab[]={ //每隔数字8，采取一次
26         0x00,0x08,0x10,0x18,0x20,0x28,0x30,0x38,0x40,0x48,0x50,0x58,0x60,0x68,0x70,0x78,
27         0x80,0x88,0x90,0x98,0xa0,0xa8,0xb0,0xb8,0xc0,0xc8,0xd0,0xd8,0xe0,0xe8,0xf0,0xf8,0xff,
28         0xf8,0xf0,0xe8,0xe0,0xd8,0xd0,0xc8,0xc0,0xb8,0xb0,0xa8,0xa0,0x98,0x90,0x88,0x80,
29         0x78,0x70,0x68,0x60,0x58,0x50,0x48,0x40,0x38,0x30,0x28,0x20,0x18,0x10,0x08,0x00};
30     uchar code sine_tab[256]={
31         // 输出电压从0到最大值 (正弦波1/4部分)
32         0x80,0x83,0x86,0x89,0x8d,0x90,0x93,0x96,0x99,0x9c,0x9f,0xa2,0xa5,0xa8,0xab,0xae,0xb1,0xb4,0xb7,0xba,0xbc,
33         0xbf,0xc2,0xc5,0xc7,0xca,0xcc,0xcf,0xd1,0xd4,0xd6,0xd8,0xda,0xdd,0xdf,0xe1,0xe3,0xe5,0xe7,0xe9,0xea,0xec,
34         0xee,0xef,0xf1,0xf2,0xf4,0xf5,0xf6,0xf7,0xf8,0xf9,0xfa,0xfb,0xfc,0xfd,0xfd,0xfe,0xff,0xff,0xff,0xff,0xff,
35         // 输出电压从最大值到0 (正弦波1/4部分)
36         0xff,0xff,0xff,0xff,0xff,0xff,0xfe,0xfd,0xfd,0xfc,0xfb,0xfa,0xf9,0xf8,0xf7,0xf6,0xf5,0xf4,0xf2,0xf1,0xef,
37         0xee,0xec,0xea,0xe9,0xe7,0xe5,0xe3,0xe1,0xde,0xdd,0xda,0xd8,0xd6,0xd4,0xd1,0xcf,0xcc,0xca,0xc7,0xc5,0xc2,
38         0xbf,0xbc,0xba,0xb7,0xb4,0xb1,0xae,0xab,0xa8,0xa5,0xa2,0x9f,0x9c,0x99,0x96,0x93,0x90,0x8d,0x89,0x86,0x83,0x80,
```

