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## Thread: High Speed IRQ Timer/Clock in C

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#1 12-27-2007

#### andrewwan1980 •

Registered User Join Date: Jun 2007 Posts: 9

# High Speed IRQ Timer/Clock in C



I found this excellent High Speed Timer (in Pascal). I compiled it (using Turbo Pascal 7 and it runs fine):

http://www.sorucevap.c om/bilisimtekn...ers.asp ?207995 and same High Speed

Timer here too: http://groups.google.co m/group/comp....7ff3cf 587648ef

I converted it to C (using p2c), compiled it

using Borland C++ 4.5 and it runs. But it crashes when it gets to setvect(...) in TimerOn.

Does anyone know how IRQ programming works in C? If you know IRQ timer/clock please contact me. I need urgent help in understanding why it's not working.

#2 12-27-2007

## andrewwan1980 •

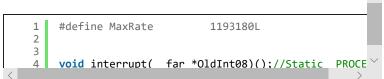
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Join Date: Jun 2007

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Here is the converted code to C. It's suppose to cycle through NewInt08, NewInt1C repeatedly. Yes, behaviour of the program is erratic, sometimes it prints out about 20 NewInt08, NewInt1C before it crashes, other times it crashes straight away. I just want someone who has done IRQ programming before to see if they can spot any mistakes am making.

### Code:



```
6
     Static unsigned short IntCount08, Trigger;
 7
     Static boolean TimerAlreadySet;
 8
     Static unsigned short Frequency;
10
     void GetIntVec(int a, void interrupt(__far *b)())
11
12
          b = getvect(a);
13
     }
14
15
     void SetIntVec(int a, void interrupt(__far *b)())
16
17
          setvect(a, b);
18
     }
19
20
21
     Static Void IrqOn()
22
23
       asm{sti;}//asm(" inline $FB");
24
25
26
27
     Static Void IrqOff()
28
       asm{cli;}//asm(" inline $FA");
29
30
     }
31
32
     /*$F+*/
33
     void interrupt NewInt1C()//Static Void NewInt1C()
34
     {printf("\nNewInt1C()");
35
       ClockTicks++;
36
37
38
     /*$F-*/
39
40
     /*$F+*/
41
     void interrupt NewInt08()//Static Void NewInt08()
42
     {printf("\nNewInt08()");
43
       IrqOff();
       asm{int 1Ch;}//asm(" inline $CD");
//asm(" inline $1C"); /*Generate INT 1Ch inst
44
45
       if (IntCount08 == Trigger) {
46
47
          IntCount08 = 0;
48
          asm{pushf;}//asm(" inline $9C");
49
          OldInt08();/*if (OldInt08.link != NULL)
              (*(Void(*) PP((Anyptr _link)))0ldInt08.pr
50
51
          else
52
              (*(Void(*) PV())0ldInt08.proc)();*/
53
       } else
54
          IntCount08++;
55
       outportb( 0x20, 0x20 );//PORT(0x20) = 0x20;
56
       IrqOn();
57
     }
58
59
60
     /*$F-*/
61
62
     Void TimerOn(Freq)
     long Freq;
63
64
       LONGINT Temp = MaxRate;
65
66
       unsigned short Count;
67
        PROCEDURE TEMP1;
68
     printf("\nTimerOn()");
       if (TimerAlreadySet)
69
70
         return:
71
       ClockTicks = 0;
72
       IntCount08 = 0;
73
       Frequency = Freq;
74
       Trigger = (long)(Freq / 18.2);
75
       Temp = (long)((double)Temp / Freq);
76
       Count = Temp;
```

```
78
        TEMP1.proc = (Anyptr)NewInt08;
 79
        TEMP1.link = (Anyptr)NULL;
        SetIntVec(0x8, NewInt08);//SetIntVec(0x8, TEMP1);
 80
 81
        GetIntVec(0x1c, OldInt1C);
 82
        TEMP1.proc = (Anyptr)NewInt1C;
        TEMP1.link = (Anyptr)NULL;
 83
 84
        SetIntVec(0x1c, NewInt1C);//SetIntVec(0x1c, TEMP1
        outportb( 0x43, 0xb6);
 85
 86
        outportb( 0x40, Count & 255);
 87
        outportb( 0x40, Count >> 8);
 88
        TimerAlreadySet = true;
 89
 90
 91
 92
      Void TimerOff()
      {printf("\nTimerOff()");
  if (!TimerAlreadySet)
 93
 94
 95
          return;
 96
        outportb( 0x43, 0xb6);
 97
        outportb( 0x40, 0xff);
 98
        outportb( 0x40, 0xff);
 99
        SetIntVec(0x8, OldInt08);
100
        SetIntVec(0x1c, OldInt1C);
101
        TimerAlreadySet = false;
102
      }
103
104
105
      Void ResetTimer()
106
107
        ClockTicks = 0;
108
109
110
111
      double TimeElapsed()
112
113
        return ((double)ClockTicks / Frequency);
114
115
116
117
      void _Timer_init()
118
119
        static int _was_initialized = 0;
120
        if (_was_initialized++)
121
          return;
122
        TimerAlreadySet = false;
123
      }
124
125
      void main()
126
127
        int i;
128
        _Timer_init();
129
130
        TimerOn(546);
131
        for(i=0; i<100000; i++) {</pre>
132
           if (i%10000==0)
               printf("\n... %d", i);
133
134
135
        TimerOff();
136
137
```

Last edited by andrewwan1980; 12-28-2007 at 04:25 AM. Reason: .

12-27-2007 #3

#### andrewwan1980 •

Registered User
Join Date: Jun 2007
Posts: 9

The thing is, it worked perfectly from a Pascal compiled source. But from C, I get this error:

16 bit MS-DOS Subsystem (DIALOG)

C:\TIMER\timer.exe

The NTVDM CPU has encountered an illegal instruction.

CS:0008 IP:08f1 OP:0f 00 74 01 c3 Choose 'Close' to terminate the application.

-----

Surely if one is allowed to do IRQ programming in Pascal and XP allows it executed 100%, then it should also work under C too.

Am just looking for oldskool experienced C IRQ programmers who is familiar with this timer code.

12-27-2007 #4

#### Salem

and the hat of int overfl



Join Date: Aug 2001 Location: The edge of the

known universe Posts: 36,491 Perhaps the NT/XP emulation of 16-bit DOS isn't as perfect as you would like it to be.

How about stating the actual problem, rather than this round-about method of converting 16-bit Pascal to 16-bit C, running on a 32-bit OS.

If you dance barefoot on the broken glass of undefined behaviour, you've got to expect the occasional cut.

If at first you don't succeed, try writing your phone number on the exam paper.

12-27-2007 #5

## Adak •

Registered User

Join Date: Sep 2006 Posts: 8,868 You have shown nothing about C, Andrew. What you've shown is that your Pascal to C converter, just didn't work exactly right.

If you want to REALLY know the reason, you'll need to pull out your ASM output from the compiler, for both program,s, and compare; see what's different.

My opinion is that software timers on Window's systems, are pretty good if you give them 1/2 second, or more. With less than 1/2 second, they become more erratic, and their margin of error grows exponentially as you decrease the time being measured.

Hardware dedicated to the purpose, and to that timing purpose alone, is the only way to get accurate measurements of very small amounts of time. Windows is not even close to being a real-time OS.

01-16-2008 #6

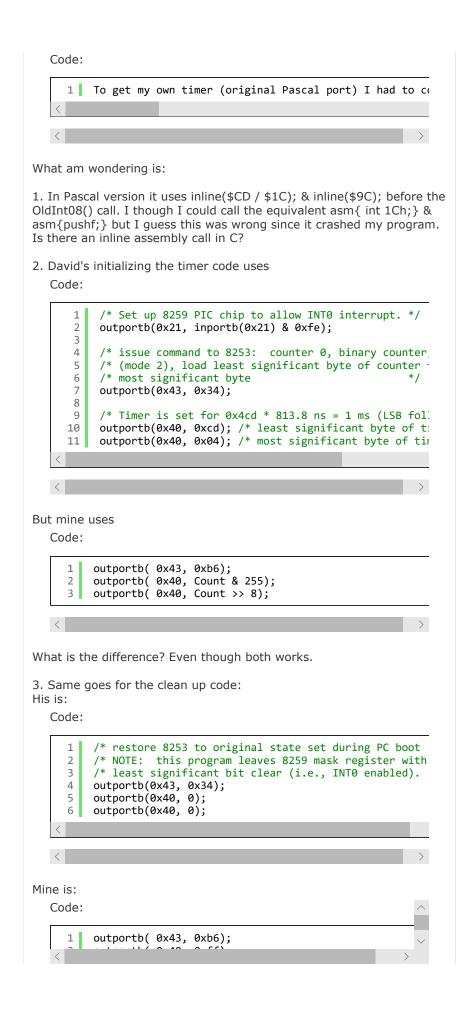
#### andrewwan1980 •

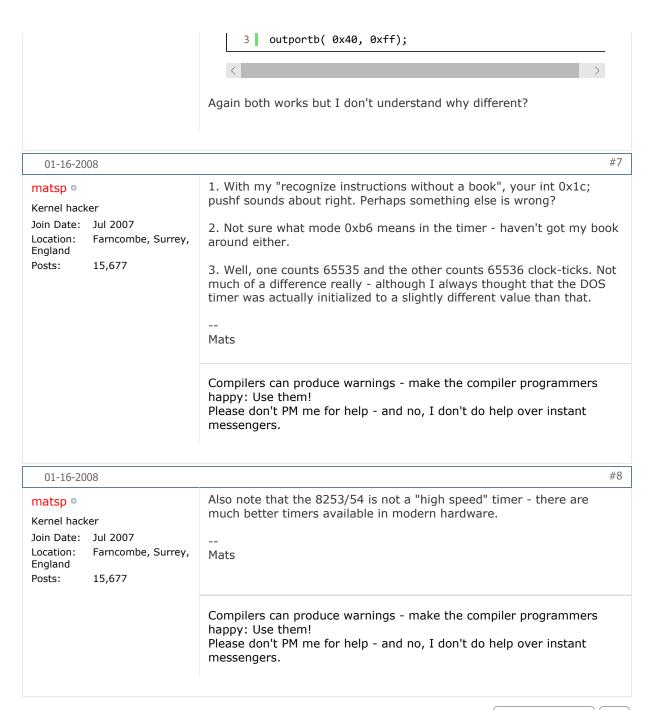
Registered User
Join Date: Jun 2007

Posts: 9

I found the closest Turbo C DOS timer source code written by David Oshinsky at:

http://www.bookcase.com/library/soft...s.turbo-c.html (TIMERTST)





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