Display time and date values in large digits
Version 1.6
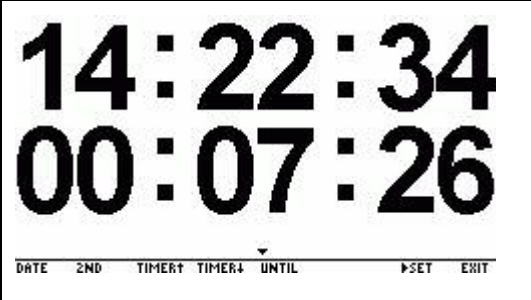
1   What does the program do?

The program displays in large digits the current time, the current date, a second time from a different timezone, a countup timer and two countdown timers, using the 24-hours time format and the DD:MM:YY year format.

2   Installation

Send these 12 files (or the whole group **uhr.v2g**) to your TI Voyage 200. Do NOT send them to any other calculator! A folder called **uhr** is created automatically.

vertel.v2z	Library from Vertyos; this is a powerful extention for the TI-Basic language which you can use for own projects as well. It takes only 7.200 bytes of user flash rom and provides many useful functions, all written in Assembler. (See remark at the bottom of this page.)
uhr.v2p	The program, written in TI-Basic.
uhr0.v2i to **uhr9.v2i**	(10 files) These are the image files, one for each digit. Every file takes 207 bytes of memory.

At the very first call, please run the program unarchived. Then stop the program and **archive all files (including the program)**, so they do not reduce your RAM memory.

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If you want to create own programs with vertel, download the package at
http://databob.free.fr/Site/Download.php?d=Progs/Ti89/Vertel2.zip.

However, you should make sure not to overwrite the version of vertel provided here with a newer version downloaded from the internet. Store newer versions of vertel in a different folder!

3   Starting the program

Start the program from the command line by typing in **uhr()** – make sure to be in the folder **uhr**! At the very first call, please run the program unarchived. After the first call you may archive the program.

You can leave the program by pressing F8. **Do not exit the program with the ON button**. If you accidentally did, please read chapter 11.

4   The "Time & Date" mode [F1]

After the start, the program displays the time and the date and updates them every second. At the bottom line you see that the word "DATE" is marked. That indicates that the program is in "Time & Date" mode.

If you want to come back to the "Time & Date" mode from another mode, press F1. If you want to set (adjust) the time and the date, press F7 (set) while the program is in "Time & Date" mode (read instructions in chapter 9 before).

5   The "SecondTime" mode [F2]

If you press F2 (named "2ND") a second time will be displayed underneath the local time. At the beginning this second time is identic with the local time. To set the time difference, press F7 (set) while the program is in "Time & SecondTime" mode.

6   The "Timer Up" mode [F3]

If you press F3 a countup timer will be displayed. It started to run when you started the program. You may reset this timer to 00:00:00 by pressing F7 (set) while the program is in "Timer Up" mode.

The timer runs in the background and is independent from other activities and other timers within the program. You may come back to the timer with F3 and see how much time elapsed in the meantime.

7   The "Timer Down" mode [F4]

If you press F4 a countdown timer will be displayed. It started to run (with the start value "23:59:59") when you started the program. You may set this timer to a duration of your choice by pressing F7 (set) while the program is in "Timer Down" mode (read instructions in chapter 9 before).

The timer runs in the background and is independent from other activities and other timers within the program. You may come back to the timer with F4 and see how much time is left.

8   The "Timer Until" mode [F5]

If you press F5 a second countdown timer will be displayed. It displays "00:00:00" until you set this timer with F7 to a target time of your choice (read instructions in chapter 9 before). Different from

the "Timer Down" mode you do not set the period ("run for 1 hour and 10 minutes") but the target time ("show the time until eight o'clock").

The timer runs in the background and is independent from other activities and other timers within the program. You may come back to the timer with F5 and see how much time is left.

9   Settings [F7]

What happens when you press F7 (set) depends on the mode, in which the program runs. If it is in "Time & Date" mode you may set the time and the date. If it is in "Time & SecondTime" mode you may choose the time difference relative to your local time. If it is in "Timer Down" mode you may choose the time for the countdown. If it is in "Timer Until" mode you may choose the target time. The only direct action happens when the program is in "Timer Up" mode – then F7 sets the timer to 00:00:00 and no input is required.

9a   F7 and "Time & Date" mode

If the program is in "Time & Date" mode and you press F7, the current time is displayed in the second line. You may now edit the time by using the cursor keys.

The line above the pair of digits indicates which part of the time will be edited, either hours, minutes or seconds. To switch between hours, minutes and seconds, use the cursor keys LEFT and RIGHT. With the cursor keys UP and DOWN you can change the respective value. (Hours, minutes and seconds are independent, which means: If you change seconds with UP to 59 and then one more step up, it switches to 00 without changing the minute value).

When everything is done and you hear the "beep" in your radio, press F7 again. If you want to cancel your changes, press ESCAPE.

After you have set the time. the date is displayed in the second line. You may change it in the same way as described above. F7 saves your changes, ESCAPE ignore them.

9b   F7 and "SecondTime" mode

If the program is in "SecondTime" mode and you press F7, you can choose between 25 time zones from -12 hours via 0 hours to +12 hours. You can choose full hours only. Press ENTER to confirm your selection. If you press ESCAPE nothing changes.

The timezone is stored as a global, achived expression called "zeitzone", taking 5 bytes of your user ROM archive. Thus, at the next start the same timezone is used.

9c   F7 and "Timer Up" mode

If the program is in "TimerUp" mode, F7 resets the timer to "00:00:00" and will continue running with this new value. No further action is required.

9d   **F7 and "Timer Down" mode**

If the program is in "TimerDown" mode and you press F7, the value "00:00:00" is displayed in the second line. You may now edit the countdown time by using the cursor keys.

The line above the pair of digits indicates which part of the time will be edited, either hours, minutes or seconds. To switch between hours, minutes and seconds, use the cursor keys LEFT and RIGHT.

With the cursor keys UP and DOWN you can change the respective value. (Hours, minutes and seconds are independent, which means: If you change seconds with UP to 59 and then one more step up, it switches to 00 without changing the minute value).

When everything is done, press F7 again and the timer starts running. If you want to cancel your changes, press ESCAPE.

9e   **F7 and "Timer Until" mode**

If the program is in "Timer Until" mode and you press F7, the value "hh:mm:00" is displayed in the second line, where "hh" stands for the current hour and "mm" for the current minute. You may now edit the target time by using the cursor keys.

The line above the pair of digits indicates which part of the time will be edited, either hours, minutes or seconds. To switch between hours, minutes and seconds, use the cursor keys LEFT and RIGHT.

With the cursor keys UP and DOWN you can change the respective value. (Hours, minutes and seconds are independent, which means: If you change seconds with UP to 59 and then one more step up, it switches to 00 without changing the minute value). You can only choose a target time for the rest of the day – e.g. setting it at 20:30:00 to 23:59:59 is possible, to 02:00:00 is impossible.

When everything is done, press F7 again and the timer starts running. If you want to cancel your changes, press ESCAPE.

10   **Ending the program [F8]**

To exit the program, push F8. Please note that timer values are not stored.

Do not exit the program with the ON button. If you accidentally did, please read chapter 10.

11   **Known problems**

As the program uses the whole screen, display problems may occur if you press keys like Shift and 2nd while the program is running. The same is true if you transfer files from or to your calculator at runtime of the program. However these problems only affect the display of the menu or status line, which may be corrupted - **the functions behind still work.**

If you accidentally finish the program by pressing the ON key, the program will not clean the display. It will even mess up the display of the home screen. But you can easily fix that. From the home screen, choose 2nd VAR-LINK and then ESCAPE, which brings the home screen back.

```
            Prgm

            Define upro(a,b,c,d)=Prgm                      display digits (two at a time)
               Local zfsum,zfright,zfleft,bef              a=Value (e.g. 27 seconds)
               string(aktzeit[a])→zfsum                    b=xpos of right digit (7)
               If dim(zfsum)=1:"0"&zfsum→zfsum             c=xpos of left digit (2)
               right(zfsum,1)→zfright                      d=ypos of both digits
               left(zfsum,1)→zfleft
               "uhr"&zfright→bef                           build filename of number-pic
               vertel("d_pict",bef,b,d,1)                  and show the picture (example:
               "uhr"&zfleft→bef                            uhr0, uhr1 …)
               vertel("d_pict",bef,c,d,1)
            EndPrgm


            Local pfeil                                    display arrow
            Define pfeil(a)=Prgm                           a=xpos of the arrow
               vertel("d_recp",0,113,239,120,1)            clear the arrow line
               vertel("t_draw","↓",a,113,1,1)              and display the arrow
            EndPrgm


            Local upro2                                    edit times and date subroutine
            Define upro2(a,b,c,d)=Prgm                     a=first value (e.g. day, hour)
               0→abbruch                                   b=second value (month, minute)
               Local eingabe,index                         c=third value (year, second)
               a→aktzeit[1]:upro(1,210,180,52)             d=flag (0=time, 1=date)
               b→aktzeit[2]:upro(2,120,90,52)
               c→aktzeit[3]:upro(3,30,0,52)
               1→index                                     set index to Pos1 (right)
               vertel("d_line",180,51,238,51,0)            sketch line above the digits

               Loop
                  getKey()→eingabe                         check user action
                  If eingabe=274: Exit                     exit at F7
                  If eingabe=264 Then
                     1→abbruch                             cancel at ESCAPE
                     Exit
                  EndIf

                  If eingabe=338 Then                      if Cursor DOWN
                     aktzeit[index]+1→aktzeit[index]       ADD 1 to respective value
                     If d=0 Then
                        If index<3 and aktzeit[index]>59:0→aktzeit[index]
                        If index=3 and aktzeit[index]>23:0→aktzeit[index]
                     Else
                        If index=3 and aktzeit[index]>31:1→aktzeit[index]
                        If index=2 and aktzeit[index]>12:1→aktzeit[index]
                        If index=1 and aktzeit[index]>99:3→aktzeit[index]
                     EndIf
                  EndIf

                  If eingabe=344 Then                      if Cursor UP
                     aktzeit[index]-1→aktzeit[index]       SUBTRACT 1 from resp. value
                     If d=0 Then
                        If index<3 and aktzeit[index]<0:59→aktzeit[index]
                        If index=3 and aktzeit[index]<0:23→aktzeit[index]
                     Else
                        If index=3 and aktzeit[index]<1:31→aktzeit[index]
                        If index=2 and aktzeit[index]<1:12→aktzeit[index]
                        If index=1 and aktzeit[index]<3:3→aktzeit[index]
                     EndIf
                  EndIf

                  If eingabe=337 Then                      if Cursor RIGHT
                     index+1→index
                     If index>3:1→index
                  EndIf

                  If eingabe=340 Then                      if Cursor LEFT
                     index-1→index
                     If index<1:3→index
                  EndIf
```

```
      If eingabe=338 or eingabe=344 Then        if Cursor UP or DOWN
         If index=1:upro(1,210,180,52)          display the new value
         If index=2:upro(2,120,90,52)
         If index=3:upro(3,30,0,52)
      EndIf
      If eingabe=337 or eingabe=340 Then        if Cursor LEFT or RIGHT
         vertel("d_recp",0,51,238,51,1)         show the new Cursor position
         If index=1:vertel("d_line",180,51,238,51,0)
         If index=2:vertel("d_line",90,51,149,51,0)
         If index=3:vertel("d_line",0,51,59,51,0)
      EndIf
   EndLoop
   vertel("d_recp",0,51,238,51,1)               delete the index line
EndPrgm
```

start of main program

```
local eingabe,i
local lastdate,lastdiff,laststop,lastzeit
local mlist,modus
local sekalt,sekdiff,sekt,sekund,sekunden,startz,startz2
local vglzeit
local userdig1,userdig2

getmode("2")→userdig1                           reads the mode Fix/Float
getmode("14")→userdig2                          reads Mode Auto/Exact/Appr
setmode("2","14")                               sets Mode Fix/Float to Float
setmode("14","1")                               sets Mode Auto to Auto

vertel("d_save","uhrscr1",0,0,239,127,"/","d_clrs")    save sreen, clear
"cd"→modus                                      start with Clock/Date-Mode
99→sekalt                                        display seconds immediately
If getType(zeitzone)="NONE" Then
   0→zeitzone                                    if necessary create zeitzone
   Archive zeitzone
EndIf
86399→sekunden                                   value 23:59:59 for timer down
startTmr()→startz2                               start timer down
startTmr()→startz                                start timer up (from 00:00:00)
{99,99,99}→lastzeit
{99,99,99}→lastdate                              set phantasy values to these
{99,99,99}→laststop                              compare operators
{99,99,99}→lastdiff
vertel("d_recp",71,10,78,17,0,"/","d_recp",71,33,78,40,0,"/","d_recp",71,61,78,68,0
,"/","d_recp",71,84,78,91,0,"/","d_recp",161,10,168,17,0,"/","d_recp",161,33,168,40
,0,"/","d_recp",161,61,168,68,0,"/","d_recp",161,84,168,91,0)
@The last (very long) line created the limiters (:) between the digit groups
{"DATE","2ND","TIMER↑","TIMER↓"," UNTIL",""," →SET","    EXIT"}→mlist
For i,1,8
   vertel("t_draw",mlist[i],(i-1)*30,123,0,1)    show the menu
EndFor
pfeil(0)                                         show the arrow
vertel("d_line",0,121,239,121,0)                 draw the bottom line

Loop                                            Main Loop of the program

getKey()→eingabe
If eingabe=0 Then                                if no button was pressed
   Loop
      getTime()→aktzeit                          Loop if it is still the
      aktzeit[3]→sekund                          same second
      If sekund≠sekalt: Exit
   EndLoop
   sekund→sekalt
   upro(3,210,180,1)                             show the seconds
   If modus="c2": upro(3,210,180,52)             if 2nd time: show seconds
```

```
   If aktzeit[2]≠lastzeit[2] Then                   if minute changed
      upro(2,120,90,1)                              show minutes
      If modus="c2": upro(2,120,90,52)             if 2nd time: show minutes
   EndIf

   If aktzeit[1]≠lastzeit[1] Then                   if hour changed
      upro(1,30,0,1)                                show hour
      If modus="c2" Then                            if 2nd time:
         aktzeit[1]+zeitzone➜aktzeit[1]            calculate 2nd hour
         If aktzeit[1]>23:aktzeit[1]-24➜aktzeit[1] adjust
         If aktzeit[1]<0:aktzeit[1]+24➜aktzeit[1]
         upro(1,30,0,52)                            show 2nd hour
      EndIf
   EndIf
   CopyVar aktzeit,lastzeit

   If modus="cd" Then                               if in time/date mode:
      getDate()➜aktzeit
      expr(right(string(aktzeit[1]),2))➜aktzeit[1]
      If aktzeit≠lastdate Then                      if date changed
         upro(1,210,180,52)                         show date
         upro(2,120,90,52)
         upro(3,30,0,52)
         CopyVar aktzeit,lastdate
      EndIf
   EndIf

   If modus="tu" Then                               if in Timer Up mode:
      timeCnv(checkTmr(startz))➜vglzeit
      vglzeit[2]➜aktzeit[1]
      vglzeit[3]➜aktzeit[2]
      vglzeit[4]➜aktzeit[3]
      upro(3,210,180,52)                            show timer seconds
      If aktzeit[2]≠laststop[2]: upro(2,120,90,52) if change: show minutes
      If aktzeit[1]≠laststop[1]: upro(1,30,0,52)   if change: show hours
      CopyVar aktzeit,laststop
   EndIf

   If modus="td" or modus="tt" Then                 if in Timer Down or UNTIL mode:
      if modus="td" then
         checkTmr(startz2)➜sekdiff
         sekunden-sekdiff➜sekdiff                   calculate rest time in sec.
      else
         sekt-(aktzeit[1]*3600+aktzeit[2]*60+
         aktzeit[3])➜sekdiff
      endif
      If sekdiff<0:0➜sekdiff                        If more than 00:00:00:
      int(sekdiff/3600)➜aktzeit[1]                  change into hrs, min, sec.
      sekdiff-aktzeit[1]*3600➜sekdiff
      int(sekdiff/60)➜aktzeit[2]
      sekdiff-aktzeit[2]*60➜sekdiff
      sekdiff➜aktzeit[3]
      upro(3,210,180,52)                            show seconds
      If aktzeit[2]≠lastdiff[2]: upro(2,120,90,52) show minutes, if changed
      If aktzeit[1]≠lastdiff[1]: upro(1,30,0,52)   show hours, if changed
      CopyVar aktzeit,lastdiff
   EndIf

EndIf                                               end of routine "no key"

If eingabe=268 Then                                 if F1
   pfeil(0)
   "cd"➜modus
   {99,99,99}➜lastdate
EndIf

If eingabe=269 Then                                 if F2
   "c2"➜modus
```

```
      pfeil(30)
      {99,99,99}➜lastzeit
EndIf

If eingabe=270 Then                                    if F3
   pfeil(60)
   "tu"➜modus
   {99,99,99}➜laststop
EndIf

If eingabe=271 Then                                    if F4
   pfeil(90)
   "td"➜modus
   {99,99,99}➜lastdiff
EndIf

If eingabe=272 Then                                    if F5
   pfeil(120)
   "tt"➜modus
   {99,99,99}➜lastdiff
EndIf

If eingabe=274 Then                                    if F7 (set) …
   If modus="tu":startTmr()➜startz             … and Timer Up
   If modus="c2" Then                          … and 2nd Time
      vertel("d_save","uhrscr2",0,0,239,127,"/","d_clrs")        save screen
      Unarchiv zeitzone
      DelVar zeitzone
      PopUp {"-12","-11","-10","-9","-8","-7","-6","-5","-4","-3","-2",
      "-1","0","+1","+2","+3","+4","+5","+6","+7","+8","+9","+10",
      "+11","+12"},zeitzone
      vertel("d_pict","uhrscr2",0,0,1)                 restore screen
      DelVar uhrscr2
      If getType(zeitzone)="NONE" Then                 ESCAPE-key?
         0➜zeitzone
      Else
         zeitzone-13➜zeitzone
      EndIf
      Archive zeitzone
      {99,99,99}➜lastzeit
   EndIf
   If modus="td" Then                          … and Timer Down
      upro2(0,0,0,0)                                   show 00:00:00
      If abbruch=0 Then
         aktzeit[3]*3600+aktzeit[2]*60+aktzeit[1]➜sekunden
         If sekunden=0:1➜sekunden
         startTmr()➜startz2
         {99,99,99}➜lastdiff
      EndIf
   EndIf

   If modus="tt" Then                          … and Until
      gettime➜aktzeit
      upro2(0,aktzeit[2],aktzeit[1],0)                 show hh:mm:00
      If abbruch=0 Then
         aktzeit[3]*3600+aktzeit[2]*60+aktzeit[1]➜sekt
         {99,99,99}➜lastdiff
      EndIf
   EndIf

   If modus="cd" Then                          … and Time / Date
      getTime()➜aktzeit
      upro2(aktzeit[3],aktzeit[2],aktzeit[1],0)
      If abbruch=0 Then
         setTime(aktzeit[3],aktzeit[2],aktzeit[1])
      EndIf
      getDate()➜aktzeit
```

```
      expr(right(string(aktzeit[1]),2))➔aktzeit[1]
      upro2(aktzeit[1],aktzeit[2],aktzeit[3],1)
      If abbruch=0 Then
         2000+aktzeit[1]➔aktzeit[1]
         Try
            setDate(aktzeit[1],aktzeit[2],aktzeit[3])   is it a correct date?
         Else
         EndTry
      EndIf
      {99,99,99}➔lastdate
   EndIf
EndIf                                        end of F7

If eingabe=275:Exit                          if F8

EndLoop                                       End of Main Program Loop

Lbl ende
DelVar aktzeit                               delete variables
DelVar upro
DelVar abbruch
vertel("d_pict","uhrscr1",0,0,1)            restore screen
DelVar uhrscr1

setmode("2",userdig1)                        resets Mode as before
setmode("14",userdig2)                       resets Mode as before

EndPrgm
```