```
L.10,600
  10REM LIST IN MODE 128. READING CENTURY & TIME
  20REM FROM THE MASTER 128 CMOS & 146818 RTC REGISTERS
  30REM DIRECTLY TO AMEND CENTURY AND PRINT TIME STRING.
  40REM VERSION 0.65 - FIRST VERSION.
  50:
  60REM ACKNOWLEDGEMENTS:- DAVID ATHERTON,
  70REM MASTER OPERATING SYSTEM, A DABHAND
  80REM GUIDE, DABS PRESS. THE ADVANCED
  90REM USER GUIDE, DICKENS & HOLMES
 100:
 110control=&FE40
 120directn=&FE43
 130slowbus=&FE4F
 140OSWRCH=&FFEE
 150OSNEWL=&FFE7
 160OSBYTE=&FFF4
 170OSRDCH=&FFE0
 180OSASCI=&FFE3
 190:
 200REM Need two safe bytes somewhere
 210REM convenient for indirection (say &9E/&9F).
 220oldvec=&9E
 230:
 240REM Use zero page MOS/FS scratch
 250REM space for TIME command for an instant
 260REM (only a very brief instant needed).
 270:
 280zp=&A8
 290:
 300M%=&4000
 310FOR D% = 4 TO 7 STEP 3
 320P%=&8000
 330O%=M%
 340[OPT D%
 350EQUB &00         \    ROM header
 360EQUW &00
 370JMP service
 380EQUB &82
 390EQUB c-&8000
 400.bin
 410EQUB &01
 420.title
 430EQUS "Time ROM"
 440EQUB&00
 450.c
 460EQUB&00
 470EQUS "(C) 2007 Raf. Giaccio"
 480EQUB &00
 490EQUS "0.65"
 500EQUB &00
 510.service
 520CMP #&27
 530BEQ reset
 540PHP             \    Try to tidy the
 550PHA             \    stack more neatly
 560TXA             \    using the older
 570               \    code.
 580PHA
 590TYA
 600PHA
>
```

```
L.610,1200
  610TSX
  620LDA &103,X
  630CMP #&04
  640BEQ command
  650CMP #&09
  660BEQ help
  670.exit
  680PLA
  690TAY
  700PLA
  710TAX
  720PLA
  730PLP
  740RTS
  750.claimed
  760LDA #0
  770TSX
  780STA &103,X
  790JMP exit
  800\
  810.command JMP comm
  820.help JMP help2
  830\
  840.reset
  850PHA
  860LDX #&00          \   Indirection
  870LDY #&FF
  880LDA #&A8
  890JSR OSBYTE
  900STX zp
  910STY zp+1
  920SEI
  930LDA &20C
  940STA oldvec
  950LDA &20D
  960STA oldvec+1
  970LDY #&12
  980LDA #hours MOD 256
  990STA (zp),Y
 1000INY
 1010LDA #hours DIV 256
 1020STA (zp),Y
 1030INY
 1040LDX &F4
 1050TXA
 1060STA (zp),Y
 1070\                     Write back ext.
 1080\                     vector - &FF12.
 1090\
 1100LDA #&12:STA &020C \ Best if blown
 1110LDA #&FF:STA &020D \ into an Eprom for ROM slot 8.
 1120CLI
 1130PLA
 1140RTS
 1150\
 1160.hours
 1170CMP #&0E
 1180\                     Jump via (oldvec)
 1190\                     if not Osword &0E.
 1200BEQ clock
>
```

```
L.1210,1800
1210JMP (oldvec)
1220\
1230.clock            \       It is Osword &0E.
1240LDX#0             \       Only work on defaults with first
1250.loop1            \       version (0.65).
1260CLC
1270JSR cmos
1280STA &C00,X        \       Use some area of safe memory
1290                  \       (try &C00 for starters), for
1300                  \       storage of register contents.
1310INX
1320CPX#10
1330BNE loop1
1340LDY &C06          \       From here,
1350                  \       reconstruct
1360                  \       the default *TIME format
1370                  \       only (at least for now).
1380LDX table,Y:JSR print_day
1390LDA #ASC",":JSR OSWRCH
1400LDA &C07:JSR add
1410LDA #&20:JSR OSWRCH
1420LDY &C08
1430LDX table,Y:JSR prtmonth
1440LDA #&20:JSR OSWRCH
1450\
1460\                         Read century (current or selected), held at
1470\                         CMOS user locations 31 & 32, say,
1480\                         and output to screen.
1490\
1500LDX#30:LDA #&A1:JSR OSBYTE:TYA:JSR OSWRCH
1510LDX#31:LDA #&A1:JSR OSBYTE:TYA:JSR OSWRCH
1520LDA &C09:JSR add
1530LDA#ASC".":JSR OSWRCH
1540LDA &C04:JSR add
1550LDA#ASC":":JSR OSWRCH
1560LDA &C02:JSR add
1570LDA#ASC":":JSR OSWRCH
1580LDA &C00:JSR add
1590LDA#&0B:JSR OSWRCH  \ Need to 'backspace' a line.
1600JMP exit            \ all done.
1610\
1620.print_day
1630.loopcx
1640LDA days,X:beq cease:JSR OSWRCH:INX:BRA loopcx
1650.cease RTS
1660.prtmonth
1670.loopcz
1680LDA months,X:beq cease:JSR OSWRCH:INX:BRA loopcz
1690\
1700.cmos                    \ This is the important subroutine.
1710PHP
1720SEI
1730PHP
1740JSR select
1750PLP
1760BCC read                 \ CLC to read the registers.
1770\
1780LDA #&41
1790STA control
1800LDA #&FF
>
```

```
L.1810,2400
1810STA directn
1820LDA #&4A
1830STA control
1840STY slowbus
1850BRA exit01
1860\
1870.read
1880LDA #&49
1890STA control
1900STZ directn
1910LDA #&4A
1920STA control
1930LDY slowbus
1940\
1950.exit01
1960LDA #&42
1970STA control
1980LDA #2
1990STA control
2000STZ directn
2010PLP
2020TYA
2030RTS
2040\
2050.select
2060LDA #2
2070STA control
2080LDA #&82
2090STA control
2100LDA #&FF
2110STA directn
2120STX slowbus
2130LDA #&C2
2140STA control
2150LDA #&42
2160STA control
2170RTS
2180\
2190.add TAY
2200LDA &88:PHA      \ Preserve contents ( + defaults only).
2210STY &88
2220LDX#0
2230LDA #&F0
2240AND &88,X
2250LSR A:LSR A
2260LSR A:LSR A
2270ADC #&30
2280JSR OSWRCH
2290LDA #&0F
2300AND &88,X
2310ADC #&30
2320JSR OSWRCH
2330PLA:STA &88
2340RTS
2350\
2360.comm            \ *Century command for centuries.
2370LDX#0
2380.C_loop
2390LDA (&F2),Y:AND#&DF
2400CMP#&0E:BEQ century
>
```

```
L.2410,3000
2410CMP stringC,X
2420BNE over
2430INY:INX
2440LDA (&F2),Y:AND#&DF
2450CMP#&OD:BNE C_loop
2460BRA century
2470.over JMP exit
2480.century
2490LDX#0
2500.Q_loopA
2510lda A_question,X
2520BEQ overthis
2530JSR OSWRCH
2540INX:BRA Q_loopA
2550.overthis
2560JSR OSRDCH:JSR OSWRCH
2570\
2580                    \ CMOS locations 31 & 32
2590                    \ will retain selected
2600                    \ century on power down.
2610\
2620TAY:LDX#30:LDA#&A2:JSR OSBYTE
2630JSR OSRDCH:JSR OSWRCH
2640TAY:LDX#31:LDA#&A2:JSR OSBYTE
2650LDX#0:.Q_loopB LDA Thankyou,x:JSR OSWRCH
2660INX:CPX#11:BNE Q_loopB:JSR OSNEWL
2670JMP claimed
2680\
2690.help2
2700JSR &FFC2
2710LDA (&F2),Y
2720CMP #&2E:BEQ long
2730CMP #&OD:BEQ short
2740INY:INY
2750LDA (&F2),Y
2760AND#&DF:CMP #ASC"M":BEQ long
2770\
2780jmp exit
2790\
2800.short JSR &FFC5
2810JSR OSNEWL
2820LDX#0:.sh LDA A_string,X:BEQ zout:JSR OSASCI:INX:BRA sh
2830.zout jmp exit
2840\
2850.long  JSR &FFC5
2860LDX#0
2870.loopH LDA stringB,X:BEQ out
2880JSR OSASCI:INX:BRA loopH
2890.out jmp claimed
2900\
2910.days
2920.day1 equs "Sun":EQUBO
2930.day2 equs "Mon":EQUBO
2940.day3 equs "Tue":EQUBO
2950.day4 equs "Wed":EQUBO
2960.day5 equs "Thu":EQUBO
2970.day6 equs "Fri":EQUBO
2980.day7 equs "Sat":EQUBO
2990\
3000.months
>
```

```
L.3010,
3010.month1 equs"Jan":EQUB0
3020.month2 equs"Feb":EQUB0
3030.month3 equs"Mar":EQUB0
3040.month4 equs"Apr":EQUB0
3050.month5 equs"May":EQUB0
3060.month6 equs"Jun":EQUB0
3070.month7 equs"Jul":EQUB0
3080.month8 equs"Aug":EQUB0
3090.month9 equs"Sep":EQUB0
3100.monthA equs"Oct":EQUB0
3110.monthB equs"Nov":EQUB0
3120.monthC equs"Dec":EQUB0
3130\
3140.A_question EQUS"Please enter TWO decimal digits for the required "
3150EQUS"century -   ":EQUB0
3160.Thankyou EQUS" Thank you."
3170\
3180.A_string EQUS"Time ROM":EQUB&0D:EQUB&00
3190\
3200.table             \ Offsets for days and months are
3210EQUB 0             \ of equal lenghts.
3220EQUB 0
3230EQUB 4
3240EQUB 8
3250EQUB 12
3260EQUB 16
3270EQUB 20
3280EQUB 24
3290EQUB 28
3300EQUB 32
3310EQUB 36
3320EQUB 40
3330EQUB 44
3340\
3350.stringB EQUB&0D:EQUS"Time ROM":EQUB&0D
3360EQUS"  Century correction. Time access is from":EQUB&0D
3370EQUS"  the Master 146818 RTC by direct access":EQUB&0D
3380EQUS"  to its registers.":EQUB&0D
3390EQUS"  CENTURY <id> <id>":EQUB&0D
3400EQUB&00
3410\
3420.stringC EQUS"CENTURY":EQUB&0D
3430\
3440.end
3450]
3460NEXT
3470H$=STR$ ~(end-&8000+M%)
3480OSCLI "SRWRITE 4000 "+H$+" 8000 7"
3490REM SAVE "V065"
```