Summary

The following software explains how an array of structures are made. It also shows how to convert a date into a string.

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      \ MI-AN-019     Arrays of Structures and Date to String Conversion
      \ The following code demonstrates how to make an array of structures and
convert
      \ the date returned by READ.WATCH into a string.

      DECIMAL
      STRUCTURE.BEGIN: READING
                       REAL-> +Voltage
                  BYTE-> +Year
                  BYTE-> +Month
                  BYTE-> +Day
      STRUCTURE.END

      ARRAY: READINGS
      10     CONSTANT NUM.READINGS

      \ Init array READINGS as a single dimension of NUM.READINGS structures.
      : INIT.READINGS ( -- )
       NUM.READINGS 1 READING ' READINGS DIMENSIONED  \ Dim 1 dimensional array
      ' READINGS ZERO.ARRAY                          \ Init array to all zeros
      ;

      \ Reads the real time clock and drops everything but the date, month and yr
      : DATE ( -- date\month\year )
       READ.WATCH
      >R >R >R 5 NDROP R> R> R>
      ;

      \ Stores the voltage on the stack at the given READING structure address.
      \ The date is stored with the voltage.
      : STORE.VOLTAGE ( f.voltage\reading.xaddr -- )
      LOCALS{ x&reading }
      x&reading +Voltage F!   \ Store the voltage reading
      DATE                    \ Get the current date
      x&reading +Year   C!    \ Store the year
      x&reading +Month  C!    \ Store the month
      x&reading +Day    C!    \ Store the date
      ;
```

```
\ DATE>$ creates a string at PAD with this format mm/dd/yy. To
\ test this word type: 24 8 94 DATE>$ TYPE. NOTE: The result must
\ immediately be TYPEd or cmoved since PAD is used as a temporary
\ buffer for a variety of other functions.
: DATE>$ ( day\month\year -- string.xaddr\cnt )
ROT SWAP                \ rearrange stack = month\day\year --
BASE @ >R               \ save the current base
DECIMAL                 \ make sure conversion is done in decimal
<#    S>D  #  #S  2DROP \ make year a double and convert
      ASCII  /  HOLD          \ insert a slash
      S>D  #  #S  2DROP \ make day a double and convert
      ASCII  /  HOLD          \ insert a slash
      S>D  #  #S        \ make month a double and convert
#>                      \ push string xaddr and cnt, cnt addr = PAD
R> BASE !               \ restore original base
;

\ TYPE.READING given a reading structure will type the voltage associated
\ with a given date.
: TYPE.READING ( reading.xaddr -- )
      LOCALS{ x&reading }
      x&reading +Voltage F@
      CR  ."  V = "  F.   ."  was read on "
      x&reading +Day    C@
      x&reading +Month  C@
      x&reading +Year   C@
      DATE>$ TYPE
;

\ Demonstrate that this code works...
: TEST.READINGS ( -- )
      INIT.READINGS
      NUM.READINGS 0
      DO
            I FLOT PI F*                  \ Push a simulated voltage = PI * I
            I READINGS STORE.VOLTAGE
      LOOP
      NUM.READINGS 0
      DO
            I READINGS TYPE.READING
      LOOP
      ;
```


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