Program Title: Calendar Functions

Contributor's Name: Gary Goodman

Address: Box 259N Route 4

City: Fredericksburg   **State:** Virginia   **Zip Code:** 22405

Program Description:

This program provides an interchangeable solution of dates and days between dates. Given two dates, the program can determine the number of days between them, or it can compute a second date from a first one and a number of days difference. Dates are input in the form mm.ddyyyy. They are output as mm/dd/yy preceeded with the correct day name.

Necessary Accesories: None.

Operating Limits and Warnings: Valid dates are from March 1, 1900 to February 28, 2100.

Reference: Calendar Functions in <u>HP-41C Standard Applications Handbook</u>, March 1980, Hewlett-Packard Company.

The initial program display is MM.DDYYYY indicating the format to be used for inputing a date. Putting in a date and pressing [A] or [B] calculates an integer day number corresponding to the date and displays the day of the week and date in the usual mm/dd/yy format. Pressing [A] causes the day number to be stored in register 01 (day#1); [B] causes it to be stored in register 02 (day#2).

You can specify a difference in days between two dates (D) by entering the difference and pressing [C]. Pressing [C] without any input value returns the number of days differece between day#1 and day#2.

Pressing [A] or [B] without any input value causes causes the corresponding date to be computed from the other date and the difference, D. For example, pressing [B] computes the date for day#2 = day#1 + D; pressing [A] computes day#1 = day#2 - D.

Equations Used:

The day number (Day#) is computed by

$$Day\# = 30.6001(m+1 + 12[\tfrac{1}{m+1}+.7]) + 365.25(y - [\tfrac{1}{m+1}+.7]) + D$$

where y is the year, m is the month, d is the day &
[...] stands for the integer part.

The day of the week is given by Day# mod 7,

where Friday = 0, Saturday = 1, ..., Thursday = 6.

The date is computed from the Day# as follows

$$A = [\frac{Day\#-122.1}{365.25}]$$

$$B = Day\# - [365.25A]$$

$$C = [\frac{B}{30.6001}]$$

$$m = C - 1 - 12[\frac{C}{14}]$$

$$d = B - [30.6001C]$$

$$y = A + [\frac{C}{14}]$$

Sample Problem

a. On what day of the week was February 19, 1946?

b. What date is 10,000 days after August 4, 1978?

c. A man born on December 18, 1913 is the father of a boy born on February 19, 1946. On what date will the father be twice as many days old as his son?

SOLUTION:

Keystrokes (SIZE 010)	Display	Comments
Part a.		
[XEQ] "CAL"	MM.DDYYYY	Initializes program.
2.191946 [A]	TUE 2/19/46	Enter date and display day/date.
Part b.		
8.041978 [A]	xxx 8/04/78	Enter Day#1, August 4, 1978.
10000 [C]	10000	Enter 10000 day difference.
[B]	xxx 12/20/05	Date2 = Date1 + 10000 days.
Part c.		
12.181913 [A]	xxx 12/18/1913	Date1 = birth date for father.
2.191946 [B]	TUE 2/19/1946	Date2 = birth date for son.
[C]	11751	Difference: Date2 – Date1.
2 [ ] [C]	23502	Enter new-diff = 2 x old-diff.
[B]	xxx 4/23/78	Father is twice as old as son.

<u>STATUS</u>

SIZE	:	010
Program Size	:	261 Bytes (38 Registers)
USER Mode	:	ON, automatically set by program
Display setting	:	FIX 0, automatically set by program

<u>DATA REGISTERS</u>

00	Contains 1 or 2 indicating key A or B was pressed
01	Day# for day 1 (key A)
02	Day# for day 2 (key B)
03	D = Day#2 - Day#1
04	scratch
05	365.25 (constant)
06	30.6001 (constant)
07	m (month) and scratch
08	d (day)
09	y (year) and scratch

<u>FLAGS USED</u>

22	Set	:	A value is being entered by the user.
	Clear	:	A value is being calculated.
27	Set	:	User mode is set on.
29	Clear	:	Numbers are displayed without decimal points.

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