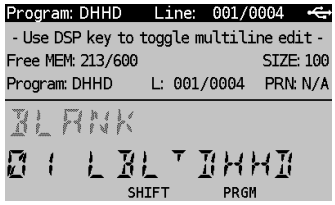
DHHD

Display





(HP-41CX, Hewlett Packard 1983 and DM41X, SwissMicros 2020)

Overview[1]

Programs `DHHD`, `D-H` and `H-D` convert decimal to hexadecimal numbers and vice versa. The DHHD program combines both ways conversions and programs the "D" and "H" keys in User Mode for direct access to the respective conversions.

Many conversion programs have been created by several users aiming to build with the least number of bytes for the programs. The ones in this document require HP-41CX functions AROT, XTOA and ATOX.

Conversions

The decimal versus hexadecimal values are shown below for the base range:

Decimal:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	14
Hexadecimal:	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

The conversion from hexadecimal to decimal is simply straightforward. The base 16 is to be used as follows for the hexadecimal number **$35DA8_{16}$**:

```
8:  8x16^0 =      8
A: 10x16^1 =    160
D: 13x16^2 =   3328
5:  5x16^3 =  20480
3:  3x16^4 = 196608 +
             220584₁₀
```

Converting this number 220584 to a hexadecimal requires a division by 16 as follows:

```
220584 / 16 = 13786.5000 ► remainder 16 * 0.5000 =  8 ► 8₁₆
 13786 / 16 =   861.6250 ► remainder 16 * 0.6250 = 10 ► A₁₆
   861 / 16 =    53.8125 ► remainder 16 * 0.8125 = 13 ► D₁₆
    53 / 16 =     3.3125 ► remainder 16 * 0.3125 =  5 ► 5₁₆
     3 / 16 =     0.1875 ► remainder 16 * 0.1875 =  3 ► 3₁₆
                                                  35DA8₁₆:
```

[1] *This program is copyright and is supplied without representation or warranty of any kind. The author assumes no responsibility and shall have no liability, consequential or otherwise, of any kind arising from the use of this program material or any part thereof*

©1999-2020 Auke Hoekstra

Example (1): D-H

KEYSTROKES	DISPLAY	COMMENTS
220583		Enter a decimal number and run D-H
[XEQ] [ALPHA] D-H [ALPHA]	35DA7	$220583_{10} = 35DA7_{16}$
747 [R/S]	2EB	$747_{10} = 2EB_{16}$
65587 [R/S]	10033	$65587_{10} = 10033_{16}$

Example (2): H-D

KEYSTROKES	DISPLAY	COMMENTS
[ALPHA] FFEFF [ALPHA]		Enter a hexadecimal number and run D-H
[XEQ] [ALPHA] H-D [ALPHA]	1.048.319,000	$FFEFF_{16} = 1048319_{10}$
[ALPHA] 1A2B [R/S]	6.699,000000	$1A2B_{16} = 6699_{10}$
[ALPHA] C0FFEE [R/S]	12.648.430,00	$C0FFEE_{10} = 12648430_{16}$
[ALPHA] CH [R/S]	0,000000	Flag and display show 0; false entry

Example (3): DHHD

KEYSTROKES	DISPLAY	COMMENTS
61453		Enter a decimal number and run DHHD
[XEQ] [ALPHA] DHHD [ALPHA]	F00D	$61453_{10} = F00D_{16}$
65261 [R/S]	FEED	$65261_{10} = FEED_{16}$
3501 [USER] [D]	DAD	$3501_{10} = DAD_{16}$ (in user mode)
[USER] [H]		In user mode convert from hexadecimal
DEC0DE [R/S]	14.598.366,00	$DEC0DE_{16} = 14598366_{10}$
[R/S] [CLA]		Run again and clear previous value
C0CA [R/S]	49.354,000000	$C0CA_{16} = 49354_{10}$
[R/S] [CLA]		Run again and clear previous value
FF [R/S]	255,000000	$FF_{16} = 255_{10}$
[USER] [H] [CLA]		Run again and clear previous value
GB [R/S]	0,000000	Flag and display show 0; false entry

Program Listing

The listing of programs `D-H`, `H-D` and `DHHD` is given on the next page:

©1999-2020 Auke Hoekstra

```
01▪LBL "D-H"
02 STO 00
03 ABS
04 CLA
05▪LBL 01
06 7
07 RCL Y
08 16
09 MOD
10 ST- Z
11 LASTX
12 ST/ T
13 RDN
14 2
15 -
16 X>Y?
17 +
18 50
19 +
20 XTOA
21 -1
22 AROT
23 R^
24 X#0?
25 GTO 01
26 AVIEW
27 RCL 00
28 END
```

(45 bytes)

```
01▪LBL "H-D"
02 AOFF
03 CF 00
04 ALENG
05 STO 00
06 CLX
07▪LBL 00
08 7
09 ATOX
10 XTOA
11 65
12 -
13 X<0?
14 +
15 10
16 +
17 X<0?
18 SF 00
19 16
20 X<=Y?
21 SF 00
22 R^
23 *
24 +
25 DSE 00
26 GTO 00
27 FS?C 00
28 CLX
29 END
```

(49 bytes)

```
01▪LBL "DHHD"
02▪LBL D
03 STO 00
04 ABS
05 CLA
06▪LBL 01
07 7
08 RCL Y
09 16
10 MOD
11 ST- Z
12 LASTX
13 ST/ T
14 RDN
15 2
16 -
17 X>Y?
18 +
19 50
20 +
21 XTOA
22 -1
23 AROT
24 R^
25 X#0?
26 GTO 01
27 RCL 00
28 PROMPT
29 GTO D
30▪LBL H
31 AON
32 STOP
33 AOFF
34 CF 00
35 ALENG
36 STO 00
37 CLX
38▪LBL 00
39 7
40 ATOX
41 XTOA
42 65
43 -
44 X<0?
45 +
46 10
47 +
48 X<0?
49 SF 00
50 16
51 X<=Y?
52 SF 00
53 R^
54 *
55 +
56 DSE 00
57 GTO 00
58 FS? 00
59 CLX
60 STOP
61 GTO H
62 END
```

(98 bytes)

Registers, Labels and Flags

REGISTERS	COMMENTS
R00	Work registers

LABELS	COMMENTS
LBL00	Loop around digits
LBL01	Loop around digits

FLAGS	COMMENTS
00	Error flag when false hexadecimal value has been entered

Downloads

The RAW/TXT format of the program is available via the website: DHHD (in zip file).

©1999-2020 Auke Hoekstra