

PROGRAM SUBMITTAL

O = only for Version 2

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Signature Gary Goodman Date July 26, 1982

PROGRAM DESCRIPTION I

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Program Title HEXADECIMAL - DECIMAL CONVERSIONS

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Program Description, Equations, Variables This program converts numbers between the hexadecimal and decimal number systems. There are two versions of this program.

Version 1 requires no accessories. It can convert decimal integers up to 268,435,455 (FFFFFFFF) and hexadecimal integers up to FFFFFFFF (16,777,215).

Version 2 requires the Extended Functions/Memory Module. It is shorter and faster than version 1 and can convert integers of 10 or less decimal digits.

Both Versions: When converting from decimal to hexadecimal, the decimal value is left in the X-register. When converting from hexadecimal to decimal, the previous contents of the X-register are retained in the Y-register so that numbers may be added or subtracted and then reconverted to hexadecimal form.

Necessary Accessories Version 1: none; Version 2: Extended Functions/Memory Module

Operating Limits and Warnings Negative and fractional numbers are not allowed.

Reference(s) Version 1 of this program is similar in concept to the Hexadecimal - Decimal Conversions program published in the HP-41C Applications Manual, but uses a faster and more compact algorithm.

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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1. Convert 123_{10} to a hexadecimal number.
2. Convert 123_{16} to a decimal number.
3. Find the decimal and hexadecimal results of $10B3FA - 9C010$

Input	Function	Display	Comments
	[XEQ] SIZE 018		Minimum size
	[XEQ] 'X-DEC or		
)	[RTN] [R/S]		Initialize Program
123	[R/S]	7B	hexadecimal equivalent
ALPHA 123	[R/S]	291.	decimal equivalent
ALPHA 10B3FA	[R/S]	1,094,650.	decimal equivalent
ALPHA 9C010	[R/S]	638,992.	" "
	[-]	455,658.	decimal result
	[R/S]	6F3EA	hexadecimal result

To solve example 1 simply proceed as follows:

Examples 2 & 3 are solved as shown for version 1 above.

[illegible]

USER INSTRUCTIONS

				SIZE: 018
STEP	INSTRUCTIONS	INPUT	FUNCTION	DISPLAY
1	Enter the program.			
2	Initialize		[XEQ] "X-DEC"	0
3	To convert a decimal number to			
	hexadecimal key in the number	D	[R/S]	H
4	To convert a hexadecimal number to decimal			
	key in the number in ALPHA mode	H	[R/S]	D.
5	To convert the number back		[R/S]	H or D.
6	To add or subtract two hexadecimal numbers			
	key in first hexadecimal number	H ₁	[R/S]	D. ₁
	key in second hexadecimal number	H ₂	[R/S]	D. ₂
	key "plus" or "minus", display decimal ans.		[+] or [-]	D. ₁ ± D. ₂
	convert answer to hexadecimal		[R/S]	H ₁ ± H ₂
	<u>Instructions for Version 2</u>			no SIZE required
1	Enter the program at the beginning point.		[GTO] "X-DEC"	
2	Proceed with step 3 above.			
	NOTE: D represents a decimal integer			
	entered in the X-register			
	H represents a hexadecimal integer			
	entered in the ALPHA register.			

PROGRAM LISTING

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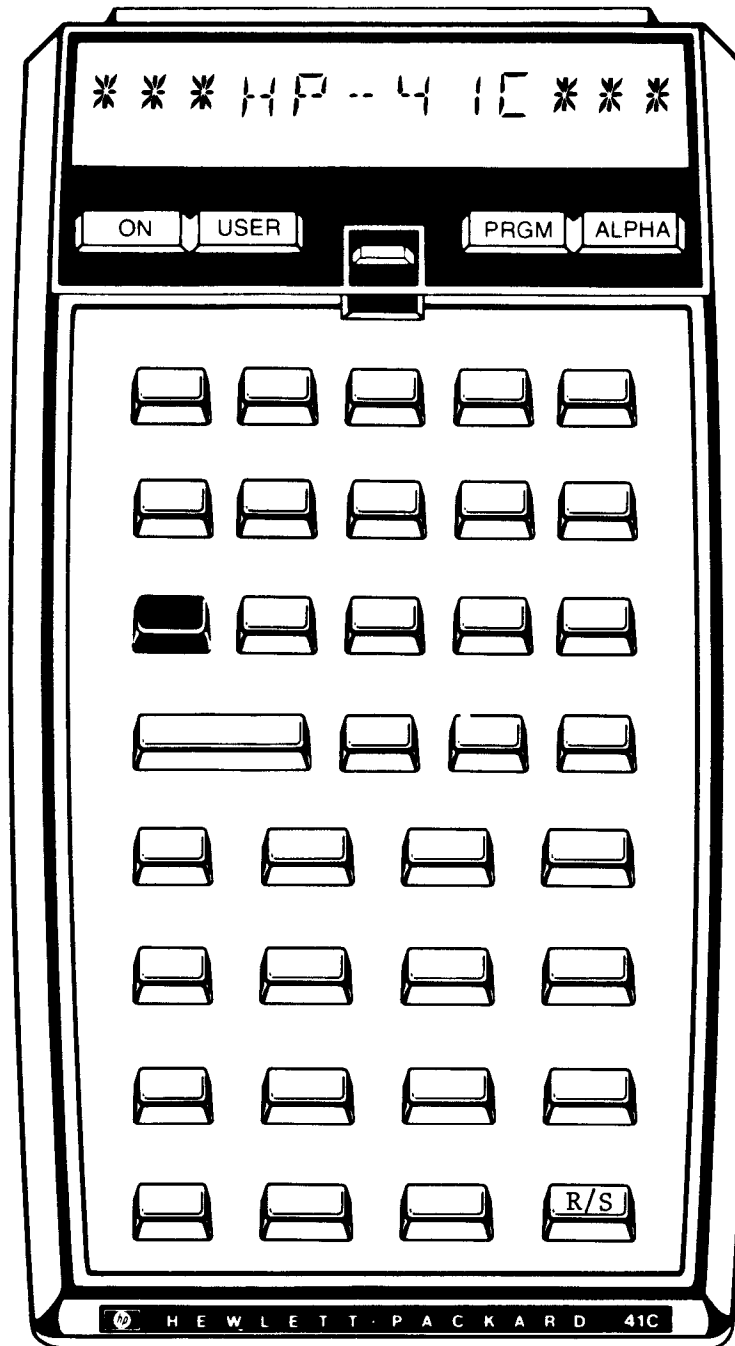
☐ 67 ☐ 97 ☒ 41C

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS
01	LBL "X-D		Initialization routine	50	AVIEW		Display hex # and RCL dec. value
EC				51	RCL 17		
02	9			52	SF 23		<u>Return and Stop</u>
03	CF 29			53	GTO 01		Convert hex to decimal
04	FIX 0			54	LBL 04		
05	LBL 03			55	0		
06	CLA			56	STO 16		Build dec. value in R16
07	ARCL X			57	LBL 05		
08	ASTO IND			58	CLST		
X				59	ASTO T		
09	DSE X			60	" "		
10	GTO 03			61	ASTO X		
11	SF 29			62	ARCL T		
12	"0"			63	ASTO Y		
13	ASTO 00			64	X=Y?		If there are no more hex digits, GTO 09
14	"A"			65	GTO 09		
15	ASTO 10			66	ASHF		
16	"B"			67	ASTO T		
17	ASTO 11			68	" "		
18	"C"			69	ARCL Y		
19	ASTO 12			70	ASHF		Pull off left-most hex digit from hex string
20	"D"			71	ASTO Y		
21	ASTO 13			72	CLA		
22	"E"			73	ARCL T		
23	ASTO 14			74	LBL 06		Search Loop
24	"F"			75	CLX		
25	ASTO 15			76	RCL IND		
26	CLA			Z			
27	CF 22			77	X=Y?		Search for matching hex digit in registers
28	LBL 01			78	GTO 07		
29	STOP			79	ISG Z		
30	AOFF			80	LBL 00		dummy instruction
31	STO 17			81	GTO 06		
32	FS?C 22			82	LBL 07		
33	CF 23			83	16		
34	FS?C 23			84	ST* 16		Accumulate dec. value
35	GTO 04			85	RCL T		
36	CLA			86	ST+ 16		
37	LBL 02			87	GTO 05		Get next hex digit
38	ASTO Z			88	LBL 09		
39	STO Y			89	RCL 17		
40	16			90	RCL 16		
41	MOD			91	GTO 01		Return and Stop
42	CLA			92	.END.		
43	ARCL IND						
X							
44	ARCL Z						
45	-						
46	16						
47	/			00			
48	X=0?						
49	GTO 02						

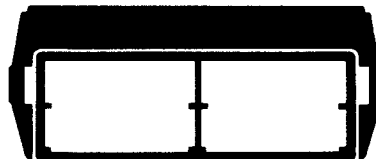
Note: Refer to "HP-41C OWNER'S HANDBOOK AND PROGRAMMING GUIDE" for specific information on keystrokes. Function index begins on page 262.
Refer to Appendix E in 67 or 97 "OWNER'S HANDBOOK AND PROGRAMMING GUIDE" for exact keystrokes.

KEYBOARD CARD LABELING

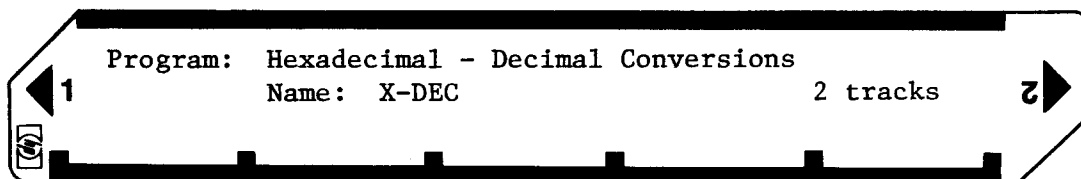
KEYBOARD



SYSTEM
CONFIGURATION



CARD



PROGRAM LISTING

41C

STEP/ LINE	KEY ENTRY	KEY CODE (67/97 only)	COMMENTS	STATUS					
01	♦LBL "X-D			SIZE	0	TOT. REG.	12	USER MODE	
EC				ENG		FIX	SCI	ON	OFF X
02	FC? 48			DEG		RAD	GRAD		
03	GTO 02			FLAGS					
04	AOFF		Hexadecimal	#	INIT	SET INDICATES	CLEAR INDICATES		
05	SF 29		to Decimal		S/C				
06	FIX 0			29	--	F29 is set for display purposes.			
07	0			48	--	Hex. to dec. Dec. to hex.			
08	♦LBL 01								
09	ATOX								
10	X=0?								
11	GTO 04								
12	50								
13	-								
14	7								
15	X<Y?								
16	ST- Y								
17	CLX								
18	2								
19	+								
20	X<>Y								
21	16								
22	*								
23	+								
24	GTO 01								
25	♦LBL 02		Decimal to						
26	ADN		Hexadecimal						
27	CLA								
28	ENTER↑								
29	♦LBL 03								
30	RCL X								
31	16								
32	ST/ Z								
33	MOD								
34	2								
35	-								
36	7								
37	X<Y?								
38	ST+ Y								
39	CLX								
40	50								
41	+								
42	XTOA								
43	SIGN								
44	CHS								
45	AROT								
46	RDN								
47	INT								
48	X>0?								
49	GTO 03								
50	♦LBL 04		Display result						
51	RDN		Put decimal value in X						
52	.END.								
				ASSIGNMENTS					
				FUNCTION	KEY	FUNCTION	KEY		