Binary Decimal conversion code for the HP-41C family

Arno Jacobs

January 7, 2022

Contents

1 Binary to Decimal conversion HP-41C code (10 bit)

key strokes	step	display code(s)	remark
[ON]			Put the calculator [ON]
[PRGM]			Enter program mode
□ GTO . .		00 REG nnn	Set program counter @ end of code
□ LBL [ALPHA]BTD[ALPHA]	01	LBL"BTD	Start position Binary Decimal conversion
STO 02	02	STO 02	Save the binary value
0	03	0	
STO 00	04	STO 00	Reset decimal value
STO 01	05	STO 01	Reset counter
□ LBL 01	06	LBL 01	Loop label
10	07	10	
STO ÷ 02	08	ST/ 02	Divide binary value by 10
RCL 02	09	RCL 02	
XEQ [ALPHA]FRC[ALPHA]	10	FRC	Get fraction of the result
10	11	10	
×	12	*	Multiply by 10
XEQ [ALPHA]INT[ALPHA]	13	INT	Only work with the integer part
2	14	2	
RCL 01	15	RCL 01	
□ y^x	16	Y↗X	$2^{counter}$
×	17	*	If bit is $'1'$
STO + 00	18	ST+ 00	Add to decimal result

key strokes	step	display code(s)	remark
1	19	1	
STO + 01	20	ST+ 01	Increment counter
9	21	9	
RCL 01	22	RCL 01	
□ X⩽Y?	23	X<=Y?	
□ GTO 01	24	GTO 01	Count 10 bits
RCL 00	25	RCL 00	Read converted value
□ RTN	26	RTN	Return
□ GTO . .		00 REG nnn	End RPN coding
[PRGM]			Leave program mode
□ ASN [ALPHA]BTD[ALPHA] LOG			Assign "BTD" to LOG
[USER]			Set USER mode

2 Decimal to Binary conversion HP-41C code (10 bit)

key strokes	step	display code(s)	remark
[ON]			Put the calculator [ON]
[PRGM]			Enter program mode
□ GTO . .		00 REG nnn	Set program counter @ end of code
□ LBL [ALPHA]DTB[ALPHA]	01	LBL"DTB	Start position Decimal Binary conversion
STO 02	02	STO 02	Save the decimal value
0	03	0	
STO 00	04	STO 00	Reset binary value
STO 01	05	STO 01	Reset counter
□ LBL 01	06	LBL 01	Loop label
2	07	2	
STO ÷ 02	08	ST/ 02	Divide binary value by 10
RCL 02	09	RCL 02	
XEQ [ALPHA]FRC[ALPHA]	10	FRC	Get fraction of the result
2	11	2	
×	12	*	Multiply by 2
XEQ [ALPHA]INT[ALPHA]	13	INT	Only work with the integer part
RCL 01	14	RCL 01	
□ 10^x	15	10↗X	$10^{counter}$
×	16	*	If bit is $'1'$
STO + 00	17	ST+ 00	Add to binary result

key strokes	step	display code(s)	remark
1	18	1	
STO + 01	19	ST+ 01	Increment counter
9	20	9	
RCL 01	21	RCL 01	
□ X⩽Y?	22	X<=Y?	
□ GTO 01	23	GTO 01	Count 10 bits
RCL 00	24	RCL 00	Read converted value
□ RTN	25	RTN	Return
□ GTO . .		00 REG nnn	End RPN coding
[PRGM]			Leave program mode
□ ASN [ALPHA]DTB[ALPHA] COS			Assign ”DTB” to COS
[USER]			Set USER mode

3 How to use the conversion routines

The routines are simple straight forward conversion routines. "BTD" does a binary to decimal conversion. "DTB" does the opposite. Both have a 10 bits resolution.

The HP-41C calculator has been set in USER-mode.
Enter a binary value and XEQ "BTD" by LOG or enter a decimal value and XEQ "DTB" by COS.

Example:

11110000
`LOG`

Output: 240

or:

Example:

253
`COS`

Output: 11111101