



# HP41CX Program Listing

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Title:	Original value prior to discount or markup/tax
Program Label:	LBL "OV" / 106 bytes
Version:	1.0
Date:	22/03/1990

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## Description

This program computes the original value of number before a discount or markup/tax was applied to it.

For instance if you find an item for sale at £48 and the discount was 20%, the program will tell you that the original price was £60 from which £12 was deducted.

It also works for tax computations to tell you how an invoice was computed. The program will show that an invoice of £146.88 was composed of a goods value of £125.00 plus £21.88 of tax at 17.5%

The program prompts for the values required and displays both values in the result as one string.

## Core Logic

To compute the value of the percentage, I have used the following two methods:

### Discount

Divide the discounted value by  $\frac{100}{\%} - 1$  e.g.  $48 \div \frac{100}{20} - 1 = \frac{48}{4} = 12$

This is then added to the discounted value to compute the original value (60)

### Markup

Divide the marked up value by  $\frac{\%}{100} + 1$  e.g.  $146.88 \div \frac{17.5}{100} + 1 = \frac{146.88}{1.175} = 125$

This is then subtracted from the marked up value to compute the tax (21.88)

This program uses the **QA** subroutine to prompt the user. You can find it on the IE site at: <http://www.inventors-emporium.co.uk> and follow the links to the HP41CX.

## Execution

When you run the program, it prompts you as follows:

**TOTAL?**                      The discounted or marked up value.

**% ?**                              The value of the percentage discount or markup.

**DISC/MARKUP?**              Touch **D** or **M** as appropriate.

The result is displayed in the following form - Original value (+/-) discount/markup e.g.

**60.00 - 12.00** or **125.00 + 21.88**

Touching **R/S** will then loop the program to the beginning for another run.

## Further information

To help with completing the VAT return here in the UK, where often there is no VAT breakdown on a shop receipt, I used the same techniques to create a dedicated program called, with stunning originality, **LBL VAT**. You can download it from the site at <<http://www.inventors-emporium.co.uk>>

It builds in the current VAT rate of 17.5% (as of January 2002) into a more compact listing, omitting the **DISC/MARKUP?** prompt.

If the tax divides into two or more rates as they did in the past then I'll have to get more creative but hopefully sanity (of a kind) will prevail.

*Program Listing follows:*



Line	Instruction	Comments
1	<b>LBL "OV"</b>	
2	"22/3/90 V1"	
3	FIX 2	
4	"TOTAL?"	Enter the discounted or marked up value
5	<b>PROMPT</b>	
6	STO 11	
7	"%?"	Enter the percentage discount or markup
8	<b>PROMPT</b>	
9	STO 12	
10	5.14	Set flag 05 if response is key 14 (D)
11	"DISC/MARKUP?"	Enter <b>D</b> or <b>M</b> to choose
12	← <b>XEQ "QA"</b>	
13	RCL 11	
14	RCL 12	
15	CLA	
16	FS? 05	
17	↓ <b>GTO 01</b>	
18	100	Discounts
19	/	
20	1	
21	+	
22	/	
23	ST- 11	
24	ARCL X	
25	APPEND "+"	
26	ARCL 11	
27	↓ <b>GTO 02</b>	
28	<b>LBL 01</b>	Markups
29	100	
30	X<>Y	
31	/	
32	1	
33	-	
34	/	
35	ST+ 11	
36	ARCL 11	
37	APPEND "-"	
38	ARCL X	

Line	Instruction	Comments
39	<b>LBL 02</b>	Display
40	<b>PROMPT</b>	Display the result as <b>ORIGINAL VALUE +/- % VALUE</b>
41	<b>↑ GTO "OV"</b>	Loop back to the start
42	<b>END</b>	

For more HP41CX programs, visit <<http://www.inventors-emporium.co.uk>>

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