commodore

ELECTRONIC DESK TOP CALCULATOR

operators instruction manual

INTRODUCTION

Dear Customer,

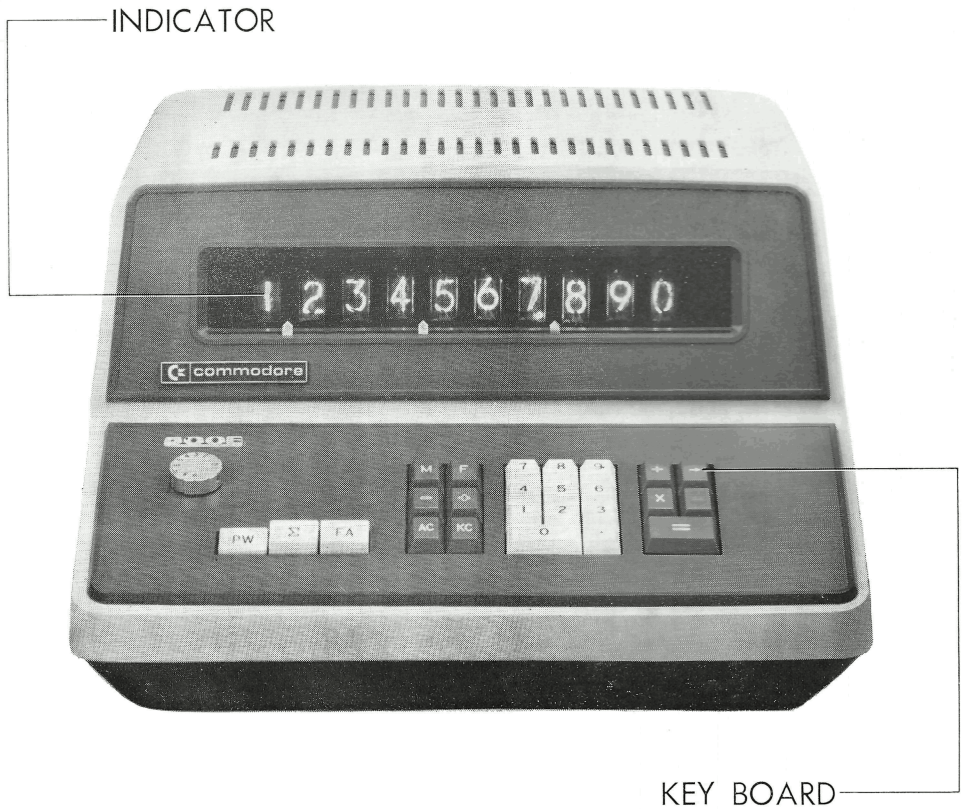
You are now the owner of a **commodore** Electronic Desk-Top Calculator Model 500E.

Please take a few minutes of your time to become familiar with this Instruction Manual. It has been written to help you to understand the meaning of the various control keys and the functions of the calculator.

Further assistance is always available upon request—just contact your dealer or write direct to :

U. S. A – **commodore** Business Machines, Inc.,
31 East 32nd Street,
NEW YORK, N. Y. 10016.

CANADA – **commodore** Business Machines (Canada) Ltd.,
946 Warden Avenue,
SCARBOROUGH, Ontario.


INDICATOR
1 2 3 4 5 6 7 8 9 0
commodore
KEY BOARD

Functions :

Calculations possible on this calculator :

Addition, Subtraction, Multiplication, Division, Square and further powers, chain Multiplication/Division, automatic accumulation of products showing individual product, accumulation of products of chain Multiplication, memory calculations, calculations with a constant.

Automatic, floating decimal point, & pre-set decimals :

Capacity :	Entry add/subtract	10 digits
	Multiplicand	10 digits
	Multiplier	10 digits
	Product/max.	20 digits
	Dividend	10 digits
	Divisor	10 digits
	Quotient	10 digits
	Memory	10 digits

Read-Out : Indication by Nixie tubes

Input : Conventional 10 key keyboard with decimal point.

Specifications :

Dimensions & Weight : 9 1/2″ H, 15″ W, 17 1/4″ D, 22 lbs.

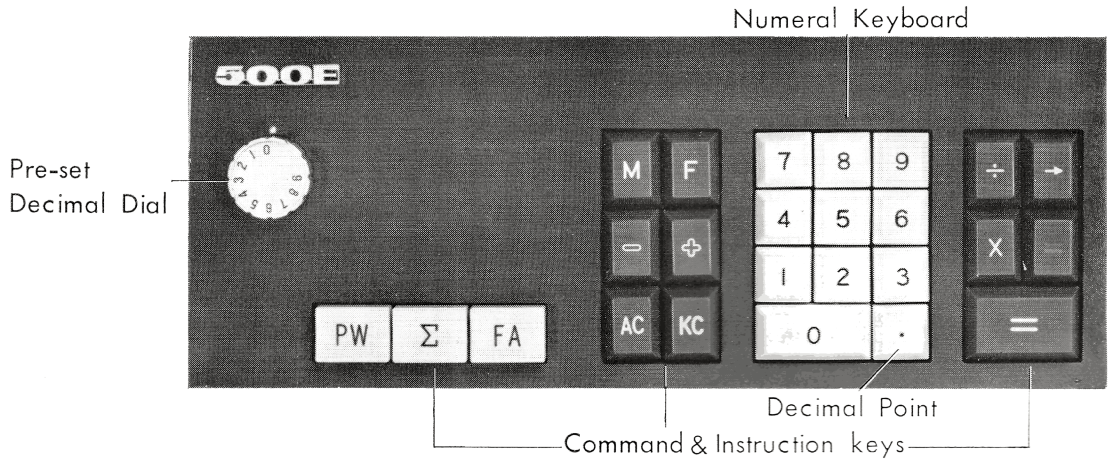
Components : Transistors and diodes

Speed : Addition and Subtraction : max. 0. 0006 sec.
Multiplication/Division : max. 0. 35 sec.

Electric Characteristics :

Electric source : 110 V, 50–60 cycles AC
Consumption : 40 W
Working temperature : 0° – 40°C

Keyboard layout :



1–90 Numeral Keys
Touching the keys in logical sequence of a number. The number is entered and indicated on read-out.

· Decimal Point
If touched at the position of the decimal point, a number with fractions is indicated and all answers are automatically correctly pointed off.

Command Keys :

X Multiplication : The key is touched after entering the first factor in multiplication.

÷ Division : This key is touched after entering the Dividend (figure to be divided).

= Equal Key : This key is used for obtaining answers in addition, multiplication, division.

= Equal Key : This key is used for obtaining answers in subtraction and difference of products in accumulative multiplication.

+ Memory addition Key : To be used for adding indicated numbers into memory.

− Memory subtraction Key : To be used for subtracting indicated numbers into memory.

M Memory enter Key : When touched, it clears a number held in the memory and enters new number into memory.

F Recalls numbers stored in the memory.

→ When touched, the indicated number is shifted one digit to the right. To be used for cutting off unwanted digits, correction of error for last digit.

KC Keyboard Clear Key : Clears numbers indicated in read-out only.

AC Answer Clear Key : Must be touched before using = for adding or subtracting.

Instruction Keys :

[FA] Full answer switch : Permits extension of capacity to 20 digits in multiplication. In division, a quotient of 10 digits is always obtained.

[Σ] Accumulation switch : When depressed, individual products will automatically be accumulated to a total and held in the memory register.

Decimal pre-setting dial : To be set to the required number of decimal places for addition/subtraction into memory.

[PW] On/Off switch : Machine should be off when not in use.

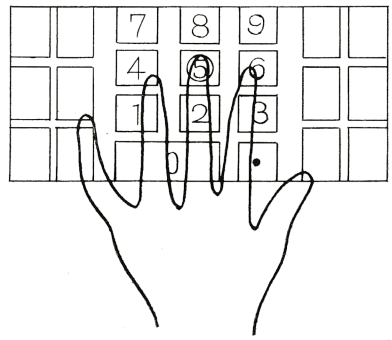
Read-out :

All numbers entered through the numeral keyboard, as well as all answers to a calculation are displayed in the read-out. The entry of a new number on the keyboard automatically clears previous display. Answers appear after touching [=] equal keys.
This centralized display system permits the operator to check visually every number entered and thereby reduces possible errors.

Before starting use of the calculator :

[PW] is in down position.
It is recommended that the calculator cord is plugged into an independent outlet. This prevents interference from other electrically operated equipment.
In case of malfunction, do not attempt to correct fault yourself. Contact dealer or Commodore sales office and request a service technician.
When cleaning the outer casing, DO NOT apply thinner or benzine. Simply wipe clean withe cloth provided.

Entry :



The keyboard is a standard 10 key keyboard. 4, 5, 6 are touch keys, distinguished by indentation. After becoming familiar with the "blind touch" system, the operator can enter all numbers without looking at the keyboard.
Double input prevention : The numeral key touched first, is always entered.
Entry is made by touching the numeral keys in logical sequence :

Example : 12, 345 Operation : [1][2][3][4][5]
[•] must be touched when the number has a decimal point.

Example : 123. 45 Operation : [1][2][3][•][4][5]
It is not necessary to touch [0] before decimal point when entering decimal fractions.

Example : 0. 0123 Operation : [•][0][1][2][3]
Correction of wrongly entered numbers is possible by touching [KC]. If the error is noticed during entry, shift [→] until the incorrect digit drops off, then enter correct number.
Answers or entries by command keys are not cleared by [KC]
If [AC] and [KC] are touched simultaneously, calculator is ALL CLEAR.

Addition and Subtraction :

Use white equal key for addition—red equal key for subtraction.

' See example on page 7 and 8 '

Multiplication : A × B

Operation of the function keys is same as formula. e. g.—Enter first factor (multiplicand) and touch [X], enter second factor (multiplier) and touch [=]. The answer (product) will be indicated in read-out. If a product answer to more than 10 digits is required, [FA] instruction key must be depressed. In this case, accumulation of products is not possible.

' See example on page 9 '

Continuous Multiplication : A × B × C

The answer to each multiplication becomes automatically the next multiplicand and it is merely necessary to touch [X] before entering next factor. When [FA] is engaged, the most significant figures are used for further multiplication, thus an exact approximate value is obtained.

' See example on page 10 '

Squaring :

To square a number, it is only necessary to enter the number once and touch [X] [=].

Raising to a higher power-enter number into memory as constant and recall with [F].

' See example on page 17

Division : Operation is same as formula—A ÷ B

Enter dividend, touch [÷], enter divisor, touch [=]. Answer will appear, decimally correct, in read-out.

' See example on page 12 and 13 '

When [FA] instruction key is engaged, a quotient to 10 digits will always be obtained.

' See example on page 12 and 13 '

To determine the number of decimal places of the quotient when dividing a whole number by a whole number, add as many zeros after touching the decimal point (Dividend) as decimal places required in the answer.

' See example on page 12 '

The remainder will be indicated by operating [KC] and [=].

A ÷ B (Dividend and divisor with decimals) (example)

A ÷ B ÷ C =

' See example on page 12 '

Automatic accumulation of products :

When [Σ] is engaged, individual products will automatically be accumulated to a total in the memory register.

To subtract an answer from stored total, touch [=] RED.

To call total at the end of the accumulation, touch [F].

' See example on page 14 ' 15 and 18 '

Accumulation of products in chain multiplication :

' See example on page 16 '

Mixed calculations :

$$A + B \div C$$

$$\frac{[(A+B) \times C]^2 \times D}{(X+Y) \times Z}$$

' See example on page 19

EXAMPLE

Addition and Subtraction :

[=] is used for Addition

[=] is used for Subtraction

Problem :

A + B + C 587 + 624 + 98 = 1309

A + B − C 463 + 125 − 287 = 301

Solution :

Instruct	Keyboard Entry	Command	Read-out
	5 8 7	[=]	5 8 7
	6 2 4	[=]	1 2 1 1
	9 8	[=]	1 3 0 9
[AC] / [KC]			
	4 6 3	[=]	4 6 3
	1 2 5	[=]	5 8 8
	2 8 7	[=]	3 0 1

EXAMPLE

Subtraction :

[=] is used for Addition [=] is used for Subtraction

Problem :

A — B — C 1265— 653—254= 358

A — B 3. 58—5. 74 =2. 16

* It is not necessary to precede the decimal point by a zero if fractions are to be entered : e. g. . 08=. 08

Solution :

Instruct	Keyboard Entry	Command	Read-out
	1 2 6 5	[=]	1 2 6 5
	6 5 3	[=]	6 1 2
	2 5 4	[=]	3 5 8
[AC]/[KC]			
	3. 5 8	[=]	3. 5 8
	5. 7 4	[=]	9 9 9 9 9 9 9 7. 8 4
		[=]	2. 1 6

EXAMPLE

Multiplication :

Problem :

A × B

153 × 912 = 139536

24. 83 × 12. 34 = 306. 4022

Solution :

Instruct	Keyboard Entry	Command	Read-out
	1 5 3	[X]	1 5 3
	9 1 2	[=]	1 3 9 5 3 6
	2 4. 8 3	[X]	2 4. 8 3
	1 2. 3 4	[=]	3 0 6. 4 0 2 2

EXAMPLE

Continuous Multiplication :

Problem :

A × B × C 72 × 68 × 35 = 171360

356. 248 × 83. 536 × 79. 628 = 2369692. 0873537

Solution :

Instruct	Keyboard Entry	Command	Read-out
	7 2	[X]	7 2
	6 8	[=]	4 8 9 6
		[X]	
	3 5	[=]	1 7 1 3 6 0
[AC]/[KC] [FA]			
	3 5 6. 2 4 8	[X]	
	8 3. 5 3 6	[=]	2 9 7 5 9. 5 3 2 9 2
		[X]	
	7 9. 6 2 8	[=]	2 3 6 9 6 9 2. 0 8 7
		[F]	3 5 3 7 6 0 0 0 0 0

Depression of FA before starting calculation permits extension of capacity to 20 figures.

EXAMPLE

Multiplication :

(extended capacity)

Problem :

A × B 2483. 117 × 1234. 413 = 3065191. 905321

Solution :

Instruct	Keyboard Entry	Command	Read-out
FA			
	2 4 8 3. 1 1 7	X	2 4 8 3. 1 1 7
	1 2 3 4. 4 1 3	=	3 0 6 5 1 9 1. 9 0 5
		F	3 2 1 0 0 0 0 0 0 0

* Depression of FA before starting calculation permits extension of capacity to 20 figures.

EXAMPLE

Division :

Problem :

A ÷ B 6573517943÷5252=1251621.847

(10 digit quotient)

A ÷ B 2249.8 ÷ 231=9.739

(quotient with pre-determined number of decimal)

Solution :

Instruct	Keyboard Entry	Command	Read-out
FA	6 5 7 3 5 1 7 9 4 3	÷	6 5 7 3 5 1 7 9 4 3
	5 2 5 2	=	1 2 5 1 6 2 1.8 4 7
AC / KC			
	2 2 4 9.8 0 0	÷	2 2 4 9.8 0 0
	2 3 1	=	9.7 3 9
KC		=	0 9 1 0 0 0 0.0 0 0

EXAMPLE

Continuous Division :

Problem :

A ÷ B ÷ C 1025÷203÷12=0. 420771756

Solution :

Instruct	Keyboard Entry	Command	Read-out
[FA]	1 0 2 5	[÷]	1 0 2 5. 0 0 0 0 0 0 0
	2 0 3	[=]	5. 0 4 9 2 6 1 0 8
		[÷]	5. 0 4 9 2 6 1 0 8 0
	1 2	[=]	4 2 0 7 7 1 7 5 6 6.
		[→]	0. 4 2 0 7 7 1 7 5 6

EXAMPLE

Memory Calculation :

Problem :

$(A \pm B) \times (C \pm D) =$ $\qquad$ $(481 + 662) \times (905 - 213) = 790956$

Solution :

Instruct	Keyboard Entry	Command	Read-out
AC / KC	4 8 1	M	4 8 1
	6 6 2	+	6 6 2
	9 0 5	=	9 0 5
	2 1 3	−	6 9 2
		X	
		F	1 1 4 3
		=	7 9 0 9 5 6

* Decimal pre-setting dial.....0

EXAMPLE

Automatic accumulation of products in Multiplication :

Problem :

$A_1 \times B_1 = C_1$	$750 \times 25 = 17625$
$A_2 \times B_2 = C_2$	$492 \times 68 = 33456$
$A_3 \times B_3 = C_3$	$295 \times 43 = 12685$
C_n	63766

Solution :

Instruct	Keyboard Entry	Command	Read-out
[Σ]	7 0 5	[X]	7 0 5
	2 5	[=]	1 7 6 2 5
	4 9 2	[X]	4 9 2
	6 8	[=]	3 3 4 5 6
	2 9 5	[X]	2 9 5
	4 3	[=]	1 2 6 8 5
		[F]	6 3 7 6 6

* Decimal pre-setting dial.....0

EXAMPLE

Accumulation of products
in chain multiplication :

Problem :

$A_1 \times B_1 \times C_1 = D_1$	$425 \times 63 \times 85 = 2275875$
$A_2 \times B_2 \times C_2 = D_2$	$603 \times 81 \times 35 = 1709505$
$A_3 \times B_3 \times C_3 = D_3$	$945 \times 29 \times 84 = 2302020$
D_n	6287400

Solution :

Instruct	Keyboard Entry	Command	Read-out
	4 2 5	[X]	4 2 5
	6 3	[=]	2 6 7 7 5
		[X]	
	8 5	[=]	2 2 7 5 8 7 5
		[M]	
	6 0 3	[X]	6 0 3
	8 1	[=]	4 8 8 4 3
		[X]	
	3 5	[=]	1 7 0 9 5 0 5
		[+]	
	9 4 5	[X]	9 4 5
	2 9	[=]	2 7 4 0 5
		[X]	
	8 4	[=]	2 3 0 2 0 2 0
		[+]	
		[F]	6 2 8 7 4 0 0

* Decimal pre-setting dial.....0

EXAMPLE

Square :

Problem :

$A^2 = B$ $\quad (123)^2 = 15129$

$A^n = B$ $\quad (25)^4 = 390625$

* To obtain the 3rd or 4th power, the number is entered into M (Memory) to be used as constant multiplier in the calculation.

Solution :

Instruct	Keyboard Entry		Command	Read-out
	1 2 3		[X]	1 2 3
			[=]	1 5 1 2 9
[AC]/[KC]				
	2 5		[M]	2 5
			[X]	
		$(25)^2$	[=]	6 2 5
			[X]	
			[F]	
		$(25)^3$	[=]	1 5 6 2 5
			[X]	
			[F]	
		$(25)^4$	[=]	3 9 0 6 2 5

* Decimal pre-setting dial.....0

EXAMPLE

Memory Calculation :

Problem :

$(A \pm B)^2 + (C \pm D)^2 =$ $(328 - 256)^2 + (429 + 125)^2 = 312100$

Solution :

Instruct	Keyboard Entry	Command	Read-out
[M]			
	3 2 8	[=]	3 2 8
	2 5 6	[=]	7 2
		[X]	
		[=]	5 1 8 4
[AC]			
	4 2 9	[=]	4 2 9
	1 2 5	[=]	5 5 4
		[X]	
		[=]	3 0 6 9 1 6
		[F]	3 1 2 1 0 0

* Decimal pre-setting dial.....0

EXAMPLE

Mixed Calculation :

Problem :

$$\frac{[(A-B)\times C]^2\times K}{(E\pm F)\times G}=H \quad \frac{[(150-72)\times 95]^2\times 0.19}{(1064+852)\times 25}=217.798308$$

Solution :

Instruct	Keyboard Entry	Command	Read-out
	1 0 6 4	=	1 0 6 4
	8 5 2	=	1 9 1 6
		X	
	2 5	=	4 7 9 0 0
		M	
AC			
	1 5 0	=	1 5 0
	7 2	=	7 8
		X	
	9 5	=	7 4 1 0
		X	
		=	5 4 9 0 8 1 0 0
		X	
	0.1 9	=	1 0 4 3 2 5 3 9.0 0
FA			
		÷	
		F	4 7 9 0 0
		=	2 1 7.7 9 8 3 0 8

* Decimal pre-setting dial.....0

EXAMPLE

Invoicing / Billing :

Item	Quantity	Weight p/pc	Total Weight	Price p/pc	Amount
	40	5.72 (kg)	228.80 (kg)	$ 36	$ 8,236.80
	2	1.5	3.0	43	129.00
	28	2.32	64.96	18	1,169.28
				Total :	$ 9,535.08

Formula : Quantity × Weight p/pc = Total Weight × Price = Amount

Solution :

Instruct	Keyboard Entry	Command	Read-out
	40	[X]	40
	5.72	[=]	228.80
		[X]	
	36	[=]	8236.80
		[M]	
	2	[X]	2
	1.5	[=]	3.0
		[X]	
	43	[=]	129.0
		[+]	
	28	[X]	28
	2.32	[=]	64.96
		[X]	
	18	[=]	1169.28
		[+]	
		[F]	9535.08

* Decimal pre-setting dial.....2

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