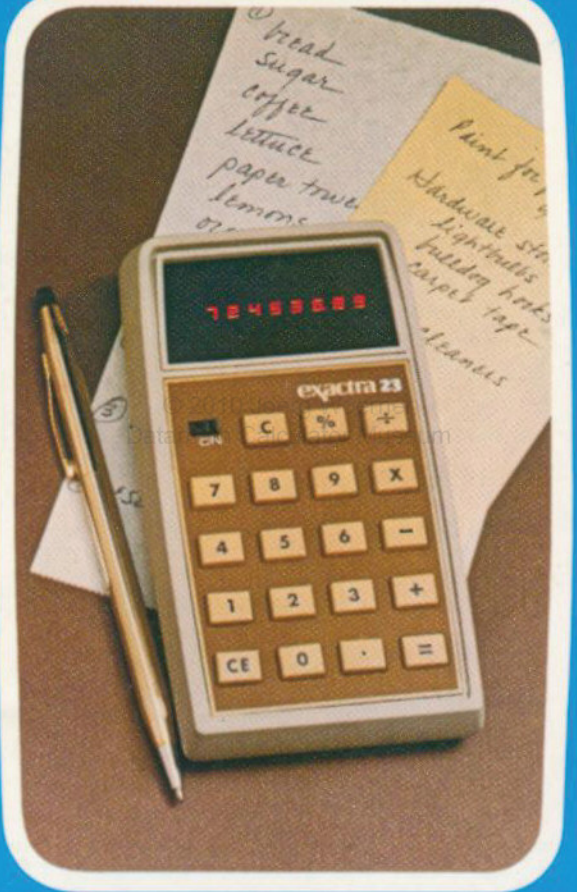
exactra 23



Portable Electronic Calculator

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Toll-Free Telephone Assistance

For assistance with your Exactra 23 calculator, call one of the following toll-free numbers if necessary:

800-527-4980 (within all continental states except Texas)
800-492-4298 (within Texas)

See page 19 and back cover for further information on service.

INTRODUCTION

Thank you for purchasing the Exactra-23 electronic calculator – the calculator that looks good while you figure. The Exactra-23 is handy around the house – balancing the checkbook, planning a budget, figuring material for home improvement – or at the store, where it helps you get the most for your money.

Features

Percent Key – [%] key permits easy calculation of percentages, taxes, discounts, and other similar problems.

Automatic Constant – Addition, subtraction, multiplication, or division with a constant number is automatic.

Easy to Operate – Press the keys in the same order as the problem is written.

Fully Portable – Weighs less than 8 ounces, fits neatly in pocket, briefcase or purse.

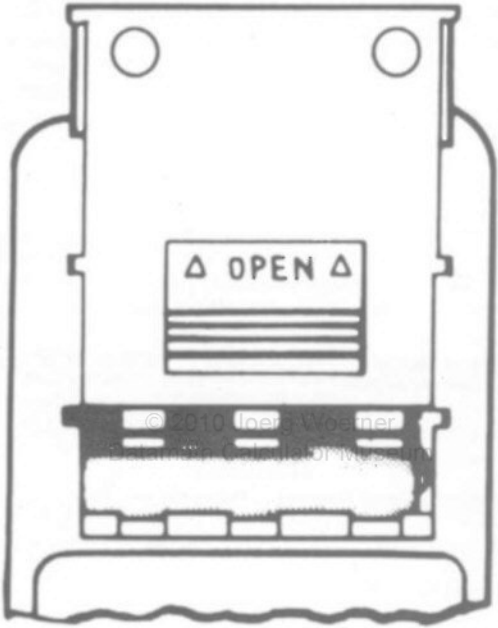
Repeat Add and Subtract – Repeated depression of the [+] or [−] key permits multiple additions or subtractions of the last number entered.

Reliability – Solid state components, integrated circuits, and a light emitting diode display provide reliable operation.

Replaceable Batteries – Three "AA" alkaline batteries provide approximately 30 hours of continuous calculations before replacement is necessary. Alkaline batteries are recommended for maximum life. The calculator can also operate from carbon-zinc batteries. However, since carbon-zinc batteries may leak when discharged, these batteries should be removed from the calculator immediately when discharged.

AC Adapter – Model AC 9160 available as an optional accessory for use in conjunction with disposable batteries.

BATTERY INSTALLATION



BACK OF CALCULATOR

Slide battery door open as shown, and install batteries according to the polarity markings in the battery cavity.

OPERATING INSTRUCTIONS

Switches

On Switch – Located on top left side of the keyboard. Turns calculator on and off.

Keyboard Operation

[0] – [9] **Keys** – Enters numbers (limit 8 digits).

[·] **Key** – Enters a decimal point.

[+] **Key** – Instructs the calculator to add the displayed number to the next entry. Repeated depressions continue to add the last number entered to the result.

[−] **Key** – Instructs the calculator to subtract the next entry from the displayed number. Repeated depressions continue to subtract the last number entered from the result. Assigns a negative sign to the following number when used after a [x] or [÷] key.

[x] **Key** – Instructs the calculator to multiply the displayed number by the next entry.

[÷] **Key** – Instructs the calculator to divide the displayed number by the next entry.

[=] **Key** – Instructs the calculator to complete the previously entered operations and display the answer. Performs the automatic constant function if no other function is pending.

[C] Key – Clears the calculator of any pending operations, including constants, and displays 0.

[CE] Key – Clears the display of the last keyboard entry unless a function ([+], [−], [×], [÷], [%]) key has been pressed.

[%] Key –Used to find percentages of numbers.

When used with the [×] or [+] keys, the [%] key computes add-on percentages such as taxes and totals. With the [−] key, the [%] key computes discounts and totals.
When the [%] key is used in division, results are expressed as a percentage. For example, the key sequence 125 [÷] 500 [%] gives 25% as the answer. The display will indicate 25. as the answer.

Display

Power On Indication – The presence of digits in the display is indication that power is on.

Minus Sign – Appears at the left of displayed number to indicate negative numbers.

Decimal Point – Automatically appears to the right of any number entered unless positioned in another sequence by use of [·] key. A zero will precede the decimal for decimal numbers.

Calculation Overflow Indication – When a calculated result is more than eight digits, the sign ⊏ will appear at the left of the display and the calculator will not accept any key instructions except the [C] or [CE] key. To determine the correct placement of the decimal, move the decimal point 8 places to the right. Pressing the [C] key will clear the number and the overflow condition from the calculator. Pressing the [CE] key will clear only

the overflow condition. The displayed number will remain for further calculation and the decimal position will remain shifted.

Decimal Alignment – In addition or subtraction problems the Exactra 23 will display in a result as many decimal places as are contained in the entry with the most decimal places. For example, the result of the problem 1.273 [−] .203 is displayed as 1.070, instead of 1.07. This decimal alignment is maintained until the [c] key is used to reset the decimal to the far right position or another problem with more decimal places is entered.

Battery Considerations – When the batteries are low the display will appear dim. Replace the batteries when this occurs.

CAUTION: Use of other than the optional AC9160 adapter may apply improper voltage to your calculator and cause damage.

OPERATING EXAMPLES

The following examples show how to operate the Exactra 23 and should be followed to become skillful at operating your calculator.

Place ON-OFF switch in the ON position, press the [c] key, and a 0. will appear in the display.

Addition and Subtraction

Example: 4.23 + 4 = 8.23

Enter	Press	Display
4.23	+	4.23
4	=	8.23

Example: 6 − 1.854 = 4.146

Enter	Press	Display
6	=	6.
1.854	=	4.146

Example: 12.324 − 7 + 1.6 = 6.924

Enter	Press	Display
12.324	−	12.324
7	+	5.324
1.6	=	6.924

Repeat Addition and Subtraction

Example: 2 + 3 + 3 + 3 = 11

Enter	Press	Display
	C	
2	+	2.
3	+	5.
	+	8.
	=	11.

Example: 21 − 4 − 4 − 4 − 4 = 5

Enter	Press	Display
21	−	21.
4	−	17.
	−	13.
	−	9.
	=	5.

Multiplication and Division

Example: 27.2 X 18 = 489.6

Enter	Press	Display
27.2	x	27.2
18	=	489.6

Example: 12 : 5.2 = 2.3076923

Enter	Press	Display
12	÷	12.
5.2	=	2.3076923

Example: (4 X 7.3) ÷ 2 = 14.6

Enter	Press	Display
4	[X]	4.
7.3	[÷]	29.2
2	[=]	14.6

Using the [CE] Key

When an incorrect number is entered in a calculation, the [CE] (clear entry) key is used to clear the display so the correct number can be entered and the calculation continued.

Example: 5 + 3 = 8

Enter	Press	Display	Remarks
	[C]		
5	[+]	5.	
4		4.	4 pressed incorrectly
	[CE]	0.	Clear entry
3	[=]	8.	Enter correct number and complete calculation

When a calculation overflow results, calculations may be continued by pressing the [CE] key. The decimal point in the final displayed result must be shifted mentally 8 places to the right to obtain the correct answer.

Example:

```
      85,000,000
    + 25,150,000
    ------------
     110,150,000
    X       12.5
    ------------
   1,376,875,000
```

Enter	Press	Display	Remarks
	C		
85000000	+	85000000.	
25150000	×	1.1015000	Correct decimal position is 8 places to the right
	CE	1.1015000	Clear overflow condition .
12.5	=	13.76875	Mentally shift the decimal point eight places to the right for correct answer

Using the Automatic Constant

The constant feature of the Exactra 23 allows multiplication or division of a series of numbers by one number and addition or subtraction of a constant number to or from a series of numbers.

A number entered before the × key in multiplication, after the ÷ key in division, after the + key in addition, and after the − key in subtraction becomes the constant.

Multiplication and Division by a Constant

Example: 4 × 5 = 20, 4 × 6 = 24, 4 × 7 = 28

Enter	Press	Display
4	×	4.
5	=	20.
6	=	24.
7	=	28.

Example: $12 \div 2 = 6$, $20 \div 2 = 10$, $44 \div 2 = 22$

Enter	Press	Display
12	÷	12.
2	=	6.
20	=	10.
44	=	22.

Addition and Subtraction of a Constant

Example: $3 + 5 = 8$, $9 + 5 = 14$, $91 + 5 = 96$

Enter	Press	Display
	C	
3	+	3.
5	=	8.
9	=	14.
91	=	96.

Example: $8 - 6 = 2$, $25 - 6 = 19$, $3 - 6 = -3$

Enter	Press	Display
8	−	8.
6	=	2.
25	=	19.
3	=	−3.

Calculations With Positive and Negative Numbers

When performing multiplication or division, a negative value is assigned to a number by pressing the [−] key before entering the number.

Example: $\left(\frac{-125}{5} + 3\right) \times (-4) = 88$

Enter	Press	Display
	[c] [−]	
125	[÷]	−125.
5	[+]	−25.
3	[x] [−]	−0.
4	[=]	88.

NOTE: When the first number of a calculation is a negative number, the previous problem must be cleared manually by pressing the [c] key (the [−] is a function key and will not automatically clear the calculator).

Performing Mixed Calculations

The Exactra 23 performs mixed calculations — combinations of add [+], subtract [−], multiply [x], and divide [÷] very easily. Just press the keys in the same order as the problem is written.

Example: 12 X 13 ÷ 14 + 15 − 16 = 10.142857

Enter	Press	Display
12	[x]	12.
13	[÷]	156.
14	[+]	11.142857
15	[−]	26.142857
16	[=]	10.142857

Using the Percent Key

The following examples show how to figure percentages, taxes, discounts, or combinations of these.

Example: 6% of $1,250.00

Enter	Press	Display
1250	[x]	1250.
6	[%]	75.

Example: $65.00 plus 5% tax

Enter	Press	Display	Remarks
65	[+]	65.	
5	[%]	3.25	Amount of tax
	[=]	68.25	Total

Example: $85.00 less 8% discount

Enter	Press	Display	Remarks
	[C]		
85	[−]	85.	
8	[%]	−6.8	Amt. of discount
	[=]	78.2	Total

Example: $125.00 less 10% discount plus 4% tax

Enter	Press	Display	Remarks
125	[−]	125.	
10	[%]	−12.5	Amt. of discount
	[=] [+]	112.5	Discounted price
4	[%]	4.5	Amount of tax
	[=]	117.0	Total

SAMPLE PROBLEMS

Finding the Best Price

A 4 lb. box of laundry detergent sells for $1.76, while a 2 1/2 lb. box sells for $1.20. Which is the better buy?

The price per pound for the 4 lb. box = $\frac{\$1.76}{4} = \$.44$

Enter	Press	Display
1.76	÷	1.76
4	=	0.44

The price per pound for the 2 1/2 lb. box = $\frac{\$1.20}{2.5} = \$.48$

Enter	Press	Display
1.2	÷	1.2
2.5	=	0.48

The 4 lb. box is cheaper by 4 cents a pound.

The important thing to remember is to find the price per unit of measure and to compare these prices. For example, if the smaller box contains 2 lbs., 10 oz. instead of 2 1/2 lbs., you must figure the price per ounce and compare these prices on a per ounce basis. The larger box contains 4 lbs. and there are 16 ounces to a pound so the larger box contains 4 X 16 = 64 ounces. Similarly, the smaller box contains 2 X 16 = 32 ounces plus 10 ounces = 42 ounces.

(continued on next page)

The price per ounce for the larger box is then

$$\frac{\$1.76}{64} = \$0.0275 \text{ or } 2.75 \text{ cents per ounce}$$

Enter	Press	Display
1.76	÷	1.76
64	=	0.0275

The price per ounce for the smaller box is

$$\frac{\$1.20}{42} = \$0.0285714 \text{ or } 2.857 \text{ cents per ounce}$$

Enter	Press	Display
1.2	÷	1.2
42	=	0.0285714

The larger box is 2.857 − 2.75 = 0.107 cents per ounce cheaper.

How Much Paint to Buy

To figure out how much paint to buy you need to know how much area is to be covered and how much area each gallon of paint will cover.

For example, a 10 by 12 foot room with 8' ceiling has 8' X 10' = 80 square feet on each of two walls and 8' X 12' = 96 square feet on each of two walls, so the total area on the walls is 80 + 80 + 96 + 96 = 352 square feet. There is 10' X 12' = 120 square feet on the ceiling, so the total square feet to be covered is 352 + 120 = 472 square feet. If one gallon of paint covers 250 square feet, then you need $\frac{472}{250} = 1.888$ gallons, and you will have to buy 2 gallons.

Balancing the Checking Account

The bank statement says your beginning balance was $58.63 and your final balance was $17.33. One check for $8.28 is still out and one deposit for $55.00 is not shown on the statement. What should your checkbook balance be?

Enter	Press	Display	Remarks
	C		
17.33	+	17.33	Enter final balance
55	−	72.33	Add deposit not shown and subtract check not cleared
8.28	=	64.05	Answer should agree with checkbook

Figuring Miles Per Gallon

Figuring miles per gallon is easy with the Exactra 23. When filling up with gas, write down the mileage. The next time you need gas, fill the car up again and write down the mileage and the amount of gasoline.

For example, if the mileage on the car is 22,532 the first fillup and is 22,689 the second fillup, and 11.2 gallons of gas are put in, the miles per gallon are figured as follows:

Enter	Press	Display	Remarks
	C		
22689	−	22689.	Enter 2nd fillup mileage
22532	÷	157.	Subtract 1st fillup mileage.
11.2	=	14.017857	Divide by gallons to find miles per gallon

Squaring a Number

The square of a number (multiplying a number by itself) can be found by pressing the [=] key after the [x] key.

Example: $25^2 = 625$

Enter	Press	Display
25	[x] [=]	625.

Finding Reciprocals

The reciprocal of a number (the result of dividing the number into one) is easily found.

Example: $\frac{1}{5+3} = 0.125$

Enter	Press	Display
	[C]	
5	[+]	5.
3	[÷]	8.
	[=]	1.
	[=]	0.125

Example: 1/16 = 0.0625

Enter	Press	Display
16	[÷] [=] [=]	0.0625

Square Roots

The Exactra 23 can be used to find the square root of a given number (that is, the number which multiplied by itself equals the given number). The square root is calculated using a repetitive process.

$$\sqrt{N} = 1/2\left(\frac{N}{A_1} + A_1\right) \approx A_2 \approx 1/2\left(\frac{N}{A_2} + A_2\right) = A_3$$

where A_1 is an initial approximation, A_2 is the calculated second approximation, and A_3 is the answer.

Example: $\sqrt{26} = 5.099$

Choose 5 as an initial approximation since $\sqrt{25} = 5$.

Enter	Press	Display	Remarks
26	÷	26.	
5	+	5.2	
5	÷	10.2	
2	=	5.1	2nd Approx.
26	÷	26.	
5.1	+	5.0980392	
5.1	÷	10.198039	Re-enter 2nd Approximation
2	=	5.0990195	Answer
	x =	25.999999	Square Answer to Check

In Case of Difficulty

1. Check to be sure the ON-OFF switch is in the on position. Presence of digits in the display indicates power is on. If no digits appear in the display, press the [C] key and 0. should appear. If a number is displayed, but key entries or the [C] key do not affect the display, switch the calculator off and then on.

2. If no display appears or if display appears dim, the batteries should be replaced. If display does not appear with new batteries, check the battery contacts in the calculator and clean off any corrosion. Check to be sure the batteries are installed properly.

3. Review the operating instructions to be certain calculations have been performed in the manner described in this book. Improper key sequence may cause an error.

If none of the above steps correct the difficulty, return the calculator postpaid for repair to a Texas Instruments Consumer Service Facility.

When returning the calculator, fully describe the exact nature of the difficulty, such as an intermittent ON-OFF switch or the problem which is not performed correctly by the calculator. **Please include your name, address, city, state, and zip code with the description of your difficulty.** If your calculator is equipped with the AC9160 adapter, include both the calculator and the adapter with your shipment.

If You Have Questions or Need Assistance

If you have questions or need assistance with your calculator, write the Consumer Relations Department at:

Texas Instruments Incorporated
P.O. Box 22283
Dallas, Texas 75222

or call Consumer Relations at 800-527-4980 (toll-free within all continental states except Texas) or 800-492-4298 (toll-free within Texas). If outside continental United States call 214-238-5461. (We regret that we cannot accept collect calls at this number.)

Warranty Registration
Owner's Copy

To protect your warranty, complete and mail the attached Warranty Registration Card within 10 days of purchase or receipt as a gift. Also record the serial number of your calculator below. Any correspondence concerning your calculator must include both model and serial number.

Ex-23

Model No. Purchase No. Purchase Date

IMPORTANT

THE WARRANTY IS VOID IF THE SERIAL NUMBER HAS BEEN ALTERED OR DEFACED.

WARRANTY

The Exactra 23 electronic calculator from Texas Instruments is warranted to the original purchaser for a period of 90 days from the original purchase date — under normal use and service against defective materials or workmanship.

Defective parts will be repaired, adjusted and/or replaced at no charge when the calculator is returned prepaid to a Texas Instruments Consumer Service Facility listed below.

The warranty is void if the calculator has been visibly damaged by accident or misuse, if the serial number has been altered or defaced, or if the calculator has been serviced or modified by any person other than a Texas Instruments Consumer Service Facility.

This warranty contains the entire obligation of Texas Instruments Incorporated and no other warranties expressed, implied, or statutory are given.

The warranty is void unless the attached Warranty Registration Card has been properly completed and mailed to Texas Instruments Incorporated within 10 days of purchase.

Texas Instruments Consumer Services Facilities

Mailing Address:
Texas Instruments Service Facility
P.O. Box 22283
Dallas, Texas 75222

Canadian Address:
Texas Instruments Service Facility
41 Shelley Road
Richmond Hill, Ontario, Canada

Consumers in California and Oregon may contact the following Texas Instruments offices for additional assistance or information:

Texas Instruments Consumer Service
78 Town and Country
Orange, California 92668
(714) 547-2556

Texas Instruments Consumer Service
10700 Southwest Beaverton Highway
Park Plaza West, Suite 111
Beaverton, Oregon 97005
(503) 643-6758

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