HAND-HELD CALCULATOR

AUTOMATIC CONSTANT
SIX FUNCTIONS
FLOATING DECIMAL

corvus

CONTENTS

Figure 1

ON/OFF SWITCH

AC/DC CONNECTOR

DISPLAY

22654897

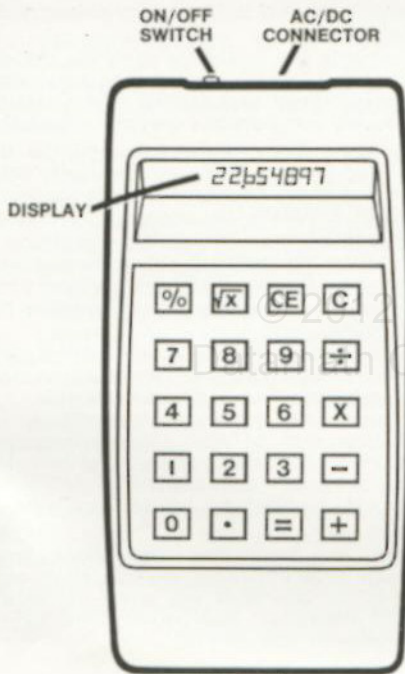| % | √x | CE | C |
7	8	9	÷
4	5	6	X
1	2	3	−
0	·	=	+

8-DIGIT MULTI-FUNCTION CALCULATOR

Today's most advanced MOS "calculator-on-a-chip" integrated circuitry provides instant addition, subtraction, multiplication, square root, percentages and division.

- Automatic constant operations with all functions
- Six functions ($+$, $-$, $\times$, $\div$, %, $\sqrt{x}$)
- Floating decimal
- Enter problems the way you write them
- True credit balance
- Mixed calculations
- LED display: 8 digits and sign
- Unique positive-touch keyboard
- Small and lightweight
- Battery-operated
- Low power consumption for longer battery life
- Optional AC adaptor

3

CALCULATOR OPERATION

ON-OFF SWITCH

The On-Off switch is located on the top end of the calculator case (see Figure 1).

NUMERIC KEYS

`0` - `9` These keys are used to enter the numbers.

DECIMAL KEY

`.` In decimal fractions, this key is used to enter the decimal point in its proper place.

CLEARING KEYS

`C` This key clears all information stored in the calculator including any displaced number, in preparation for a new problem. Returns display to a single zero and decimal point (0.).

`CE` You can use this key to "erase" or clear a number entered by mistake if you use it before touching any of the operation keys. This allows you to correct an entry error during a chain calculation without affecting previous results. Returns display to a single zero and decimal point (0.). (Striking the `CE` key after terminating a calculation will not affect the display.)

OPERATION KEYS

`×` Instructs the calculator to multiply the displayed number by the **next** numeric entry. During chain calculations it will simultaneously complete any previous calculation.

`÷` Instructs the calculator to divide the displayed number by the **next** numeric entry. During chain calculations it will simultaneously complete any previous calculation.

`+` Instructs the calculator to add the displayed number to the next numeric entry. During chain calculation it will simultaneously complete any previous calculation.

`−` Use this key to instruct the calculator to subtract the **next** entry **from** the displayed number. During chain calculations it will simultaneously complete any previous calculation.

`%` Use this key to determine percentages or percentage rates as a whole number (rather than in terms of 1/100ths).

`√x` Use this key to automatically obtain the square root of the displayed number. (During chain calculations, first complete the previous calculation with the `=` key and then obtain the square root with the `√x` key.)

`=` This key terminates calculations previously begun (division, multiplication, etc.). It is the operative key when calculating with constants. See pages 10-12 for examples of calculations.

NUMERIC AND SYMBOL DISPLAY

Your calculator displays up to 8 digits. The decimal point can be in any of 8 places. A ninth (leftmost) position is not a digit but is used to display a negative number or an OVERFLOW condition:

— This symbol indicates a negative number.

E This symbol indicates an excessive number of digits has been entered. The numbers displayed will be the most significant digits entered. "Erase" the symbol and entry with the C or CE key.

□ This small box indicates a calculation has resulted in an "Overflow", that is, has exceeded the calculator's capabilities. NOTE: The displayed answer will be approximately correct but it will be necessary to mentally "move" the decimal point 8 places to the right. See examples on page 14.

FLOATING DECIMAL

Your calculation is equipped with full floating decimal capabilities and will carry results of calculations to the maximum number of places (decimal points) required by the answer, within the unit's 8-digit capacity. It does not round off fractions to the nearest number, but rather truncates them. For example, 10 ÷ 6 would display 1.6666666 rather than 1.6666667.

CONSTANT FEATURE

An automatic built-in constant allows you to use a constant factor in addition, subtraction, multiplication, division, and percentage calculations. See examples on pages 10-12.

RECIPROCALS

Another feature of this calculator is its ability to obtain reciprocals ($1/x$). Enter the number, depress the ÷ key, and depress the = key twice. See example on page 8.

POWERS

Powers of whole numbers may be obtained by entering the number, depressing the X key, and then the = key. The calculator will now display the square or second power of the number entered. Successive powers are obtained by continuing to depress the = key. The exponent may be a positive or negative whole number. See example on Page 13.

SIMPLICITY OF ENTRY

Note that entering problems is very easy. You simply enter the problem in the same order as you would write it; for example, 4 ÷ 2 = .

SAMPLE CALCULATIONS

	ENTRY	DISPLAY	NOTES
ADDITION			
73.50 + 5.14 =	C	0.	
	73.5	73.5	Not necessary to enter
	+	73.5	insignificant zeros
	5.14	5.14	
	=	78.64	
SUBTRACTION			
56.0 − 21.37 =	C	0.	
	56	56.	Illustrates full floating
	−	56.	decimal capability
	21.37	21.37	
	=	34.63	
MULTIPLICATION			
(1) 704.5 × 6.2 =	C	0.	
	704.5	704.5	
	×	704.5	
	6.2	6.2	Insignificant zeros in
	=	4367.9	result not displayed
(2) 5.5 × (−7.2) =	C	0.	
	5.5	5.5	
	×	5.5	
	−	5.5	
	7.2	7.2	
	=	−39.6	

	ENTRY	DISPLAY	NOTES
DIVISION			
(1) 100 ÷ 6 =	C	0.	
	100	100.	
	÷	100.	
	6	6.	
	=	16.666666	
(2) 100 ÷ (−6) =	C	0.	
	100	100.	
	÷	100.	
	−	100.	
	6	6.	
	=	− 16.666666	
(3) −100 ÷ 6 =	C	0.	
	−	0.	
	100	100.	
	÷	− 100.	
	6	6	
	=	− 16.666666	

MIXED OR CHAIN CALCULATIONS

$$\left\{\frac{(1.5 \times 4) + 3}{6}\right\} -7.4 =$$

ENTRY	DISPLAY	NOTES
C	0.	
1.5	1.5	
×	1.5	
4	4.	**+** key has terminated the 1.5 × 4 calculation (=6)
+	6.	
3	3.	
÷	9.	**÷** key has terminated the previous addition step (6 + 3)
6	6.	
−	1.5	
7.4	7.4	
=	− 5.9	

	ENTRY	DISPLAY	NOTES
SQUARE ROOT			
$\sqrt{1.78} =$	C	0.	
	1.78	1.78	
	$\sqrt{x}$	1.3341664	Answer correct to 7 decimal places
RECIPROCAL			
(1) 1/5 or 1 ÷ 5 =	C	0.	
	5	5.	
	÷	5.	
	=	1.	Intermediate result
	=	0.2	
(2) 1/0.85 or 1 ÷ 0.85 =	C	0.	
	.85	0.85	
	÷	0.85	
	=	1.	
	=	1.1764705	
(3) $\dfrac{35 \times 12}{75 + 175}$	C	0.	
	75	75.	
	+	75.	
	175	175.	
Problem may be stated:	÷	250.	
	=	1.	
$\dfrac{1}{75 + 175} \times \dfrac{35 \times 12}{1}$	=	0.004	
	×	0.004	
	35	35.	
	×	0.14	
	12	12.	
	=	1.68	

	ENTRY	DISPLAY	NOTES

PERCENTAGE

		ENTRY	DISPLAY	NOTES
(1)	Determine percentage	C	0.	
	200.00 Base	200	200.	
	× 15% Percentage rate	×	200.	
	= Percentage	15	15.	
		%	30.	**%** acts as equals key

		ENTRY	DISPLAY	NOTES
(2)	Discount: Determine net amount after	C	0.	
	discount	200	200.	
	200.00 Base	−	200.	
	− 10% Discount	10	10.	
	=	%	20.	
		=	180.	Discount Total Cost

		ENTRY	DISPLAY	NOTES
(3)	Mark-up: Gross profit is a mark-up of base	C	0.	
	cost (Base + Percentage Rate)	200	200.	
	200.00 Base	+	200.	
	+ 15% Percentage rate	15	15.	
	= Total amount	%	30.	$ Mark-up
		=	230.	Total Cost

		ENTRY	DISPLAY	NOTES
(4)	On a base price of $200.00, the gross	C	0.	
	profit desired is 10% of the selling price;	200	200.	
	therefore cost is equal to 90% of selling	÷	200.	
	price.	90	90.	
	200 = 90% (x)	%	222.22222	(= $222.22)
	then $x = \dfrac{200}{90\%}$			
	Where x = Selling Price			

	ENTRY	DISPLAY	NOTES
(5) Finding percentage rate	C	0.	
40 is equal to what percent of 200?	40	40.	
$40 = x\%\ (200)$	÷	40.	
	200	200.	
	%	20.	(20%)
(6) Mixed percentage	C	0.	
400 items at $25.00 each less 20% dis-	400	400.	
count (before duty) plus 15% import duty	×	400.	
= total cost	25	25.	
	−	10000.	
	20	20.	
	%	2000.	$ Discount
	+	8000.	$ Before Duty
	15	15.	
	%	1200.	$ Duty
	=	9200.	Total Cost
CONSTANT			
(1) Addend 125 250 212	C	0.	
+25 +25 +25	25	25.	Enter constant number first
	+	25.	
	125	125.	
	=	150.	
	250	250.	
	=	275.	
	212	212.	
	=	237.	

			ENTRY	DISPLAY	NOTES
Minuend			C	0.	
(2) 100	100	100	100	100.	Enter constant number first
−25	−36	−80	−	100.	
			25	25.	
			=	75.	
			36	36.	
			=	64.	
			80	80.	
			=	20.	
Subtrahend			C	0.	
(3) 125	250		−	0.	Enter function first
−25	−25		25	25.	Enter constant number next
			+	25.	
			125	125.	
			=	100.	
			250	250.	
			=	225.	
Multiplier			C	0.	
(4)			2.5	2.5	Enter constant number first
100 × 2.5 =			×	2.5	
125 × 2.5 =			100	100.	
(205 × 2.5) × 3 =			=	250.	
			125	125.	
			=	312.5	
			205	205.	
			=	512.5	
			×	512.5	Illustrates constant factor is updated
			3	3.	to 512.5 when ✕ is keyed.
			=	1537.5	

			ENTRY	DISPLAY	NOTES
Divisor			C	0.	
(5) $\frac{6}{3}$	$\frac{156}{3}$	$\frac{918}{3}$	6	6.	
			÷	6.	
			3	3.	2nd entry in division is constant
			=	2.	
			156	156.	
			=	52.	
			918	918.	
			=	306.	
Percentage Rate			C	0.	
(6) 20% of 150			20	20.	Enter constant number first
20% of 200			%	0.20	
20% of 300			×	0.20	
			150	150.	
			=	30.	
			200	200.	
			=	40.	
			300	300.	
			=	60.	
Percentage Base			C	0.	
(7) 10% of 200 =			200	200.	Enter constant number first
15% of 200 =			×	200.	
40% of 200 =			10	10.	
			%	20.	
			15	15.	
			%	30.	
			40	40.	
			%	80.	

	ENTRY	DISPLAY	NOTES

POWERS

(1) 16^n

	ENTRY	DISPLAY	NOTES
	C	0.	
	16	16.	
	×	16.	1st power
	=	256.	2nd power
	=	4096.	3rd power
	=	65536.	4th power
	=	1048576.	5th power
	=	16777216.	6th power
	=	□ 2.6843545	Overflow. See Page 14

(2) 2^{-3}

Problem may be written

$\dfrac{1}{2^3}$

	ENTRY	DISPLAY	NOTES
	C	0.	
	2	2.	
	X	2.	1st Power
	=	4.	2nd Power
	=	8.	3rd Power
	÷	8.	
	=	1.	
	=	0.125	

CLEARING (Use of CE)

(1)   1.12
  +3.33
  +4.13

	ENTRY	DISPLAY	NOTES
	C	0.	
	1.12	1.12	
	+	1.12	
	3.33	3.33	
	+	4.45	
	4.4	4.4	Error in entry
	CE	0.	(Previous results still maintained)
	4.13	4.13	
	=	8.58	

	ENTRY	DISPLAY	NOTES
OVERFLOW			
Entry overflow	C	0.	
123456789	123456789	E12345678.	Last digit not displayed
Resultant overflow:	C	0.	
12345678 × 9 =	12345678	12345678.	
	×	12345678.	
	9	9.	
	=	□ 1.1111110	
Resultant Approximation	C	0.	
with Overflow	98765432	98765432.	
98765432 × 9 =	×	98765432.	
	9	9.	
	=	□ 8.8888888	Mentally "move" decimal point 8 points to right for approximate result of 888888880. (Correct result is actually 888888888.)
MISOPERATION			
2 ÷ 0 =	C	0.	
	2	2.	
	÷	2.	
	0	□ 0.	

MAINTAINING CALCULATOR
Cleaning
Case may be cleaned with alcohol. Display window may be cleaned with glass cleaner.
Storage
Unit should not be exposed for any prolonged period to temperatures below −40°F or above 150°F (these temperatures might be encountered in a closed automobile, for example).

TROUBLE SHOOTING
If a problem occurs, verify that the power switch is "ON" (slide switch pushed toward AC Adaptor — see Fig. 1).

Symptom	Power Source	Remedy
No Display	Battery	Check or replace batteries; observe correct polarity
Weak Display	Battery	Check or replace batteries; observe correct polarity
No Display	AC	Check that AC/DC adaptor is plugged into a proper outlet
Display Lit But Result Incorrect	Either	Review operating instructions

If the remedies suggested do not cure the problem, refer to your service certificate for instructions.

NOTE: Batteries are not guaranteed by the calculator manufacturer. Also note that "AA" type batteries *must not be returned* if unit is returned for servicing.

POWER
An AC adaptor is supplied with 0311 models for your hand-held calculator from a standard 115 VAC wall outlet.
(AC adaptor is not included in 0310 models but may be ordered separately.)
Batteries will have a longer life if you turn off calculator when not in use and if you will "clear" the calculator with the **C** after obtaining calculation results.

TO REPLACE BATTERIES
(Models 0310 and 0311)
Your unit is shipped with four "AA" batteries. They are readily accessible by removing the battery cover on the bottom of the calculator case. Push the battery latch cover in the direction away from the label on the back of the case, and remove the cover. Remove old batteries and replace new ones according to the battery outline in the battery compartment. This will insure correct polarity of batteries. *Failure to properly install the batteries will result in failure of the calculator to operate.*
Batteries which may be used in your calculator include but are not necessarily limited to the following:

15

Company	Carbon Zinc	Alkaline
Eveready	815, 915, 1015	E-91
Mallory	M15R	MN-1500, SA15AA
Panasonic	UM-3, UM-3D, UM-3N	AM-3
Ray-O-Vac	5AA, 7AA	815

IF YOUR UNIT IS EQUIPPED WITH NICKEL-CADMIUM BATTERIES (MODEL 0312)

Owners of units powered by nickel-cadmium batteries should observe the following precautions:

(1) Never operate unit more than 12 hours without recharging. (If unit is operated for longer periods, battery life may be reduced.)

(2) Recharge batteries for 12 hours, using charger supplied with unit.

    (a) Turn calculator to OFF position

    (b) Plug charger cord into calculator and the charger into any convenient AC outlet

NOTE: The unit can be operated while the charger is "plugged in" to an AC outlet, but this will disconnect the charging circuit and charging will not occur during calculator operation. The unit is protected against accidental overcharge of batteries.

(3) Nickel-Cadmium Battery Replacement Replacement should be performed only by an authorized service center. (See Service Certificate.)

GLOSSARY

ARITHMETIC TERMS

I. Subtraction	Minuend	100
	Subtrahend	−25
	Result (Difference)	75

II. Multiplication	Multiplicand (1st factor)	25
	Multiplier (2nd factor)	× 6
	Result (Product)	150

III. Division	Dividend	150
	Divisor	÷ 6
	Result (Quotient)	25

IV. Addition	Augend	100
	Addend	+25
	Result (Sum)	125

OTHER COMMON TERMS

Percent: From Latin "Per Centum." ("For each hundred") Symbolized by "%". Thus 7% means 7 parts of 100 parts or 0.07 (7/100) of the whole.

The percent key % on your calculator computes percentages, percentage rates and percent bases automatically, including proper placement of the decimal point.

Constant: A quantity or factor in a calculation that remains the same in a series of similar calculations.

Square and power: The square of a number is the result of that number multiplied by itself or the "second power", for example $12 \times 12 = (12^2) = 144$. Your calculator can automatically perform the squaring function or raise to higher powers, e.g. 3^3 or 3^5 (see page 12 for examples).