




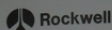
**The
Rockwell 900
series programmable
calculators...**

...Machines for people.
People for productivity.
Productivity for profit.

Basic Operation
Instruction

 **Rockwell**





900 Series

TABLE OF CONTENTS

	PAGE
FOREWORD	3
GENERAL CARE OF THE ROCKWELL 900 SERIES	3
EXPLANATION OF KEYS	4 - 10
THE DISPLAY	10
REFERENCE PROBLEMS	
1. SUBTOTAL, AUTOMATIC REPEAT AND CREDIT BALANCE	11
2. INDIVIDUAL AND GRAND TOTALS (CROSSFOOTING)	11
3. MULTIPLICATION AND DIVISION	12
4. CHAIN MULTIPLICATION AND DIVISION	12
5. CONSTANT MULTIPLICAND AND DIVISOR	13
6. AVERAGES	13
7. PERCENTAGE CALCULATIONS	14
8. DISCOUNTS AND SALES TAX	14
9. CHAIN DISCOUNTS	15
10. THE MEMORY: ADDITION AND SUBTRACTION	15
11. ACCUMULATION OF PRODUCTS AND QUOTIENTS	16
12. INVOICE APPLICATION	17
13. CONSTANT PERCENTAGE	18
14. ROOTS, POWERS AND LOGS	18
GENERAL INFORMATION ON CARING FOR YOUR MAGNETIC CARDS	19
GENERAL INSTRUCTIONS ON USING MAGNETIC CARDS	
SECTION I. LOADING A PROGRAM	19
SECTION II. RECORDING A PROGRAM	19
SECTION III. TESTING A CARD	20
SECTION IV. LOADING DATA	20
SECTION V. RECORDING DATA	20
SECTION VI. "NOTCHING" THE MAGNETIC CARD	21
OPERATING A PROGRAM USING MAGNETIC CARDS	21
ERROR CONDITIONS	23
CHANGING THE PAPER ROLL	24
CHANGING THE RIBBON	24



900 Series

Your Rockwell 900 Series programmable calculator has been designed to function as both an excellent calculator and a powerful micro-computer.

This instruction book is for those who will be running programs written by others. It explains the various function keys, the operation of the calculator and how to use magnetic cards to run programs. Some practice examples have been included to enable you to gain confidence and proficiency in the use of your new calculator.

If you would like information on how to program the 900 Series, please ask your salesman for a copy of the Rockwell 900 Series Programming Guide.

You may write some programs that you would like to share with us. If so, we would be happy to hear from you. Please mail any such programs to:

Rockwell International
Business Equipment Division
950 De Guigne Drive
Sunnyvale, California 94086
Attention: Software Development Department

(or)

Rockwell International
Sumlock Anita Limited
Anita House Rockingham Road
Uxbridge Middlesex UB8 2XL
England

GENERAL CARE OF THE ROCKWELL 900 SERIES

The Rockwell 900 Series is a rugged, easy-to-care-for series of programmable calculators.

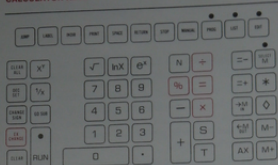
You can turn your machine on in the morning and leave it on all day. It is not necessary to turn it off until you leave at night. If the machine is accidentally left on overnight, it will not be harmed.

Be sure that your calculator is properly grounded. Use an adapter plug if necessary. The air vents at the back of the calculator should not be covered while the calculator is on. Do not place the calculator in intense direct sunlight or near heating devices.

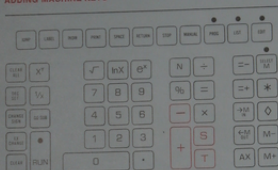
It is a good habit to use a dust cover when the calculator is not in use. This prevents dust and debris from collecting in the unit. Heavy books and other objects should not be placed on top of the calculator as the printing mechanism may be affected.

When the machine is turned off, all information will be lost. If you wish to save your program or save numbers stored in the memories, just record this information on magnetic cards before turning off your calculator.

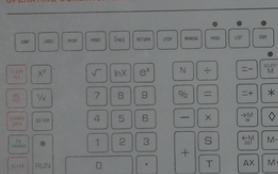
CALCULATOR KEYS



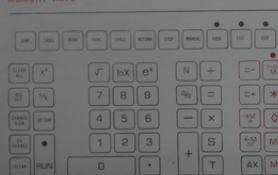
ADDING MACHINE KEYS



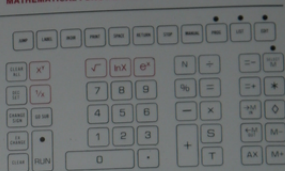
OPERATING CONDITION KEYS



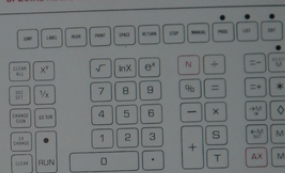
MEMORY KEYS



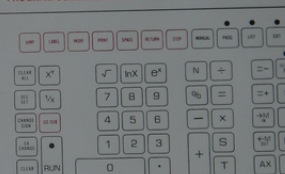
MATHEMATICAL FUNCTION KEYS



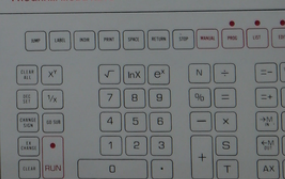
SPECIAL REGISTER KEYS












PROGRAM COMMAND KEYS



PROGRAM MODE KEYS



EXPLANATION OF KEYS

		Printer Symbols	Reference Problem #
The following is an explanation of the keys which will be used for most of your calculations.			
Numeral Keys	These keys are used to enter numbers into the machine.	0-9	
	 - 		
Decimal Key	This key is used to correctly place the decimal point in digit entries. Entries can be made with any number of decimal places, regardless of decimal settings.		
			
Clear Key	[CLEAR] is used to eliminate wrong entries and incompleted multiplication and division problems.		
			
	1. Depressing [CLEAR] immediately after entering a number will clear the entry only. Nothing will print.		
	2. Depressing [CLEAR] after using an operating key will clear an incomplete multiplication or division problem and print the clear symbol on the tape.	0.C	
	3. If the result of a calculation is larger than the capacity of the calculator (10^{11} or 100,000,000,000,000), the unit will overflow, E will print and the keyboard will lock. The answer that prints will be correct if multiplied by 10^{11} . Depressing [CLEAR] twice will reset the overflow, clear the keyboard and print the clear symbol on the tape.	0.C	
	4. An entry larger than 10^{11} or a mathematically impossible calculation such as division by 0 will also lock the keyboard. Depressing [CLEAR] will eliminate this condition and allow you to continue working. Nothing will print.		
	5. [CLEAR] does not clear the adding machine (use [T]).		
Plus Key	To add or subtract, depress [+] or [-] after each digit entry. Examples: 110[+]389[+]T; 450[-]223[-]T.	+	1, 2, 6
Minus Key		-	1, 12
	 		
Total Key	Depressing [T] prints the total and clears the adding machine.	T	1, 2, 6, 12
			
	When any operating key (such as [x], [÷], [=] or [%]) is depressed immediately after [+] or [-] is used, that operating key will total, print and clear the adding machine, then use the total in the operation. A "T" (for total) will print beside the operating key symbol. Some examples are shown to the right. Other operating keys which function in this way are [=+], [= -], [√], [ln x], [e ^x], [X ²], [1/x] and [EXCHANGE].	× T ÷ T = T % T	6
Subtotal Key	Depressing [S] prints the subtotal, but does not clear the contents of the adding machine.	S	1
			
Multiplication Key	To multiply A times B, depress A [x] B [=]. This key prepares the calculator to multiply, performs chain multiplication, and establishes the first factor as a constant if [=], [=+], [= -] or [%] is depressed after the second factor is entered.	×	3, 4, 5, 7, 8, 9, 11, 12, 13
			
	Successive multiplication by a constant is accomplished by entering a new multiplier and depressing [=], [=+], [= -] or [%].		5

		Printer Symbols	Reference Problem #
Division Key	To divide A by B, depress A \div B [=]. This key prepares the calculator to divide, performs chain division and conditions the calculator to accept the next factor as a constant divisor if [=], [=+], [=−] or [%] is depressed. Successive division by a constant is accomplished by entering a new dividend and depressing [=], [=+], [=−] or [%].	\div	3, 4, 5, 6, 7, 11 5
Equals Key	Depressing [=] completes a multiplication or division problem.	=	3, 4, 5, 6, 14
Percent Key	The percent key computes percentage calculations in multiplication and division. When used as an equals key in multiplication or division, it allows you to enter a factor as a percentage instead of a decimal. 1. When multiplying by a percentage, a second depression of [%] automatically adds the answer to the original amount. This is very helpful when computing discounts and sales tax. If the percentage amount is to be subtracted (as when computing discounts), depress [CHANGE SIGN] before depressing [%] [%]. The result will be automatically subtracted from the original amount. In division, a second depression of [%] has no effect.	%	7, 8, 9, 12, 13 8, 9, 12
Select Memory Key	When the calculator is first turned on, it will automatically address memory 1. This means that the six memory keys [M+], [M−], [=+], [=−], [\diamond] and [\circ] will address memory 1. To select another memory, use the [SELECT M] function. The six memory keys will then address the new memory until another is selected. For example, depressing [SELECT M] 5 will cause [M+], [M−], [=+], [=−], [\diamond] and [\circ] to address memory five. 1. The [SELECT M] key can select memories one to nine only. 2. The number of the memory selected will show in the extreme left side of the display of your calculator. When it is first turned on, a "1" will automatically be shown in the left side of the display. If, for example, you touch [SELECT M] 8, an "8" will be displayed. 3. If there is a number stored in the memory selected, the red light directly above the select memory key will be illuminated.	%	9 SE 1-9 11, 12
Memory Plus/Minus Key	[M+] adds to the memory selected. [M−] subtracts from the memory selected by [SELECT M]. Depressing [M+] without entering a number will add the last figure printed on tape into memory (repeat addition). Depressing [M−] without entering a number will subtract the last figure printed on tape from the contents of memory (automatic error correction and repeat subtraction).	M+ M−	1-9 10
Equals Plus/Minus Key	[=+] (or [=−]) completes a multiplication or division problem and then adds (or subtracts) the answer in the memory selected by [SELECT M]. [=+] and [=−] address memories one to nine only.	= M+ M−	1-9 11, 12

Print Key



This key will print the contents of the keyboard register.

c

Space Key



The Space key will advance the paper tape one line. Nothing will print.

Add Mode Switch



Add Mode will automatically set the decimal when adding.

1. When the Add Mode Switch is in the Add Mode position during addition and subtraction, the decimal is automatically printed in accordance with the decimal setting. Key in [DEC SET] 2 for dollars and cents, [DEC SET] 1 for tenths, [DEC SET] 3 for mills, etc.
2. When in Add Mode, the decimal or zeros must be entered for whole amounts. For instance, \$10.00 is entered as 1000 or as 10 [.] .
3. To temporarily override the fixed decimal setting, simply index the decimal in the correct position. For instance, to enter 4.555 when the decimal is set on 2, index 4 [.] 555.
4. The Round Off Switch (see below) must not be in the FL position as this will override the Add Mode function.
5. The calculator will not be affected by the Add Mode Switch, so you can multiply and divide as you normally would.
6. When set in the Calc position, all entries are treated as whole numbers unless the decimal point key is depressed.

6

Round Off Switch



RO—Round Off

When in the Round Off position, the calculator will round off all results in accordance with the decimal setting. Example: If [DEC SET] 1 was depressed, a result of 4.251 would be rounded to 4.3 (5 or more is rounded up).

3

Truncate

When the Round Off Switch is in the Truncate position, decimal places beyond the setting of the decimal are dropped. Example: If [DEC SET] 1 was depressed, a result of 4.251 would be truncated to 4.2.

3

FL—Floating

When the Round Off Switch is in the Floating position, the decimal in an answer floats automatically to the highest capacity of the calculator. This setting overrides the decimal setting and the Add Mode setting.

3

Under any conditions, the calculator has floating input to give maximum accuracy. Only answers will be rounded or truncated.

Memory In
Key



This key allows you to add, subtract, exchange or store a number in any memory.

1. To store an amount in a memory and remove any value previously stored there, enter the amount, depress [M IN] and the memory number (always two digits). For example, to store the amount 25 in memory 9, depress 25 [M IN] 09. 25 will now be in memory nine and any value previously stored there will be cleared.

2. To add an amount to the contents of a memory, enter the amount, depress [M IN] [+] and the memory number (always two digits). For example, to add the amount 12 to memory eight, enter 12 [M IN] [+] 08.

3. To subtract an amount from a memory, enter the number, depress [M IN] [-] and the memory number. For example, to subtract the amount 5 from memory two, depress 5 [M IN] [-] 02.

→M 1-9
or
→M

→M+ 1-9
or
→M+

→M- 1-9
or
→M-

←M 1-9
or
←M

Memory Out
Key



Depressing [M OUT] and a memory number will recall and print (but not clear) the contents of the memory chosen. For example, depressing [M OUT] 05 will recall and print the contents of memory five. You must always use two digits (01, 02, 03, . . .) to select a memory with the [M OUT] function.

The [M IN] and [M OUT] functions work independently from the [SELECT M] function. The [SELECT M] function can select only memories one thru nine, causing [M+], [M-], [=+], [= -], [◇] and [⊗] to address only that memory selected. [M IN] and [M OUT] can be used to access any memory, including the one already selected by [SELECT M].

1. **Crossfootting.** The calculator handles individual and grand total addition (crossfootting) automatically. Depressing [AX] will print individual totals without clearing the grand total or disturbing any memory.

If any action key is depressed, the individual total will be lost. Action keys are [=], [=+], [= -], [√], [1/x], [e^x], [X²], [%] and [1/x] keys. Depressing [X] or [÷] while in chain mode will also cause the individual total to be cleared.

2. **Accumulation of First and Second Factors.** When [=+] and [= -] are used to accumulate products and quotients, the first and second factors of each problem are automatically accumulated in separate registers. Depressing [AX] once will print the sum of the first factors. Depressing [AX] immediately again will print the sum of the second factors. These two accumulations may be recalled as often as you like even after [=] has been depressed. They will be automatically cleared when you start a new problem.

3. **Accumulations with the Percent Key.** When [%] is used with a constant multiplier or divisor, entries and results are automatically accumulated. Depressing [AX] once will print the sum of the results. Depressing [AX] immediately again will print the sum of all the entries (except for the constant).

4. **Non-Add Function.** [AX] will print dates and reference numbers if depressed immediately after indexing the number.

This key automatically computes the square root of an entry or answer. The result will always float, regardless of the decimal setting.

AX 2

F 1 12
F 2

F 1 13
F 2







#

√ 14

Square Root
Key



If you try to take the square root of a negative number, E will print and the keyboard will lock.

		Printer Symbols	Reference Problem #
Natural Log Key	This key automatically computes the natural log ($\log_e X$) of an entry or answer. X must be greater than zero. The answer will be correct to 10 significant digits.	LN	14
			
Antilog Key	This key automatically computes the natural antilog of an entry or answer.	e^x	14
	This key raises the transcendental number e to the power x , for any real number X . The answer will be correct to 10 significant digits.		
Power Key	This function will raise any real number X to any real power y . X must be greater than zero. The answer will be correct to 10 significant digits. This function uses the formula $X^y = e^{y \ln x}$.	x^y	14
			
Reciprocal Key	This function computes and prints the reciprocal of an entry or an answer. (The reciprocal of x is 1 divided by x . The reciprocal of 2 is 1 divided by 2).	$\frac{1}{x}$	14
			
Memory Indirect Key	This key, used mainly for programming, accesses a memory indirectly. For a more detailed explanation of this key, please refer to the Rockwell 900 Series Programming Guide.	$\rightarrow M$ $\leftarrow M$	
			
Exchange Key	This key exchanges the order of multiplier and multiplicand (or divisor and dividend). When [EX] is depressed immediately before depressing [=], $A \times B$ will become $B \times A$; $A \div B$ will become $B \div A$.	EX	
			

THE DISPLAY

Your Rockwell calculator has a large, easy to read display that is useful in a variety of areas. There are just two simple rules that you must know:

1. Immediately after you touch [+/-] or [=], the display will show the contents of the main adding machine. This provides you with a running subtotal when you are adding.
2. In all other cases, the display will show the number in the keyboard register.

There are several benefits that you can get from these rules:

1. You can check entries to be sure they are accurate before touching an operating key.
2. If you turn the PRINT switch to off, you have an excellent display calculator.



REFERENCE PROBLEMS

1. SUBTOTAL, AUTOMATIC REPEAT AND CREDIT BALANCE

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
	T	0.00 T
+12.34	12.34 +	12.34 +
-34.56	34.56 -	34.56 -
+36.25	36.25 +	36.25 +
+36.25	+	36.25 +
+36.25	+	36.25 +
+36.25	+	36.25 +
86.53 (Subtotal)	S	86.53 S
-229.369	229.369 -	229.369 -
+76.62	76.62 +	76.620 +
-66.22 (Total)	T	66.22 T

The keyboard is buffered for efficient operation.

Depressing [S] will print the subtotal without clearing the grand total.

To repeat add, depress [+] without re-entry.

If necessary, numbers can be entered with more decimal places than the setting of the [DEC SET] key. Extra zeros will print after each new entry to show that the digits are being carried. When [T] is touched, the total will print to the original decimal setting.

Negative answers (credit balances) print in red.

2. INDIVIDUAL AND GRAND TOTALS (CROSSFOOTING)

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
	T	0.00 T
1+2+3= 6	1 +	1.00 +
4+5+6=15	2 +	2.00 +
7+8+9=24	3 +	3.00 +
Grand Total 45	AX	6. A X
	4 +	4.00 +
	5 +	5.00 +
	6 +	6.00 +
	AX	15. A X
	7 +	7.00 +
	8 +	8.00 +
	9 +	9.00 +
	AX	24. A X
	T	45.00 T

Depressing [AX] will print and clear individual totals without disturbing the grand total.

Depressing [T] will print and clear the grand total.

3. MULTIPLICATION AND DIVISION

SETTINGS: Decimal: See problem, ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
Decimal: 2 ■ FL $575.25 \times 1.3 = 747.825$	575.25 × 1.3 =	575.25 × 1.3 = 747.825
Decimal: 2 ■ ↓ $575.25 \times 1.3 = 747.82$	575.25 × 1.3 =	575.25 × 1.3 = 747.82
Decimal: 2 ■ RO $575.25 \times 1.3 = 747.83$	575.25 × 1.3 =	575.25 × 1.3 = 747.83
Decimal: 4 ■ FL $2 \div 3 = .66666666 \dots$	2 ÷ 3 =	2. ÷ 3. = 0.666666666666
Decimal: 4 ■ ↓ $2 \div 3 = .6666$	2 ÷ 3 =	2. ÷ 3. = 0.6666
Decimal: 4 ■ RO $2 \div 3 = .6667$	2 ÷ 3 =	2. ÷ 3. = 0.6667

All products, quotients and sums can be rounded, truncated or floated, depending on the requirements of the problem.

4. CHAIN MULTIPLICATION AND DIVISION

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
$1.23 \times 4.56 \times 7.89 \times 3.69 = 163.30$	1.23 × 4.56 × 7.89 × 3.69 =	1.23 × 4.56 C × 7.89 C × 3.69 = 163.30
$1451 \div 11.99 \div 2.3 = 52.62$	1451. ÷ 11.99 ÷ 2.3 =	1451. ÷ 11.99 C ÷ 2.3 = 52.62

There can be an unlimited number of chain multiplication and divisions as long as the capacity of the calculator is not exceeded. When chaining, intermediate answers will internally float to maximum accuracy.

The C in the printout tells you that the calculator is in a chain condition.

5. CONSTANT MULTIPLICAND AND DIVISOR

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
$12 \times 8 = 96$	12 \times	12. \times
$12 \times 6 = 72$	8 $=$	8. $=$
$12 \times (-25) = -300$		96.00
	6 $=$	6. $=$
		72.00
	* 25 CS $=$	25. $=$
		300.00
$700 \div 25 = 28.00$	700 \div	700. \div
$1063 \div 25 = 42.52$	25 $=$	25. $=$
$-0.8374 \div 25 = -0.03$		28.00
	1063 $=$	1063. $=$
		42.52
	.8374 CS $=$	0.8374 $=$
		0.03

When multiplying, the first factor is automatically retained as a constant until [\times] or [\div] is depressed again.
In division, the second factor (divisor) is automatically retained as a constant until [\times] or [\div] is depressed again.

*Please note that CS stands for [CHANGE SIGN].

6. AVERAGES

SETTINGS: Decimal: 2 ■ RO ■ Add Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
	T	0.00 T
+1.23	123 +	1.23 +
+4.56	456 +	4.56 +
+7.89	789 +	7.89 +
+1.47	147 +	1.47 +
15.15	\div	15.15 \div T
Average = $15.15 \div 4$	N	4. N 1
= 3.79	$=$	4. $=$
		3.79

Depressing [N] shows how many items were added and also allows you to use this number in further calculations.

Depressing [\div] or [\times] without a keyboard entry immediately following a [\div] or [\times] will clear and print the total, then set the total up as a dividend (or multiplicand).

7. PERCENTAGE CALCULATIONS

SETTINGS: Decimal: 4 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
PERCENT MULTIPLICATION	200 ×	200. ×
What is 15% of 200?	15 %	15. %
$200 \times 15\% = 30$		30.0000
PERCENT DIVISION	2 ÷	2. ÷
2 is what percentage of 3?	3 %	3. %
$2 \div 3\% = 66.6667\%$		66.6667

8. DISCOUNTS AND SALES TAX

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
Compute a 10% discount on \$1234.50 then find the new net.	1234.50 ×	1234.50 ×
$1234.50 \times (-10\%) = 123.45$	10 CS %	10. %
		123.45
$1234.50 - 123.45 = 1111.05$	%	1111.05 T
Find and add 5% sales tax to \$110.25	110.25 ×	110.25 ×
$110.25 \times 5\% = 5.51$	5 %	5. %
		5.51
$110.25 + 5.51 = 115.76$	%	115.76 T

[CS] is depressed in the first problem since a discount is involved.

Depressing [%] once will compute and print the discount or tax amount. Depressing [%] immediately again will subtract the percentage amount (if [CS] was depressed) from the original amount, or add the percentage amount to the original amount, then print the new net amount.

9. CHAIN DISCOUNTS

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
1234 less 20% and 10% = 888.48	1234 × 20 CS %	1234. × 20. % 246.80
	% 10 CS %	987.20 T 10. % 98.72
		888.48 T
\$109.60 less 15%, plus 5% tax = \$97.82	109.60 × 15 CS %	109.60 × 15. % 16.44
	%	93.16 T
	5 %	5. % 4.66
		97.82 T

Chain discounts are computed easily. Enter the first discount and depress [%] twice to print the discount and new net. Enter the second percentage and depress [%] once. The calculator will print both the new discount and the new net.

10. THE MEMORY: ADDITION AND SUBTRACTION

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
+10	*	0.00 * 1
+20	10 M+	10. M 1
+30	20 M+	20. M 1
(Subtotal = 60)	30 M+	30. M 1
+40	◇	60. ◇ 1
-50	40 M+	40. M 1
+60	50 M-	50. M 1
(Subtotal = 110)	60 M+	60. M 1
+70	◇	110. ◇ 1
+80	70 M+	70. M 1
-90	80 M+	80. M 1
170	90 M-	90. M 1
	*	170.00 * 1

When the calculator is first turned on, memory one is addressed automatically and a 1 will show in the display. The six memory keys—[M+], [M-], [←+], [←-], [◇] and [*]—will address memory one only and a 1 will print on the tape until another memory is selected.

Depressing [◇] will print but not clear the contents of memory.

Depressing [*] will print and clear the contents of memory.

11. ACCUMULATION OF PRODUCTS AND QUOTIENTS

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
	[SELECT M] 3	S E 3
	*	0.00 * 3
9 × 8 = 72	9 ×	9. ×
5 × 6 = 30	8 = +	8. =
14 × 3 = 42 (Credit)		72.00 M 3
25 ÷ 5 = 5 (Credit)	5 ×	5. ×
57 ÷ 3 = 19	6 = +	6. =
74		30.00 M 3
	14 ×	14. ×
(Credit) 3 = -		3. =
		42.00 M 3
	25 ÷	25. ÷
(Credit) 5 = -		5. =
		5.00 M 3
	57 ÷	57. ÷
3 = +		3. =
		19.00 M 3
	*	74.00 * 3

Depressing [SELECT M] 3 will cause the six memory keys—[M+], [M-], [=+], [= -], [◇] and [*]—to address memory three. A 3 will print to the right of the tape indicating the memory being addressed.

If you want these six keys to address another memory, memory seven for instance, depress [SELECT M] 7. Now you can add to or accumulate in memory 7. Any totals stored in other memories will be undisturbed.

12. INVOICE APPLICATION

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM			KEYBOARD ENTRY	PRINT OUT
Parts	Price	Extension	[SELECT M] 1	S E 1
36	\$1.25	\$ 45.00	*	0.00 * 1
48	.75	36.00	T	0.00 T
98	2.40	235.00	36 ×	36. ×
182		\$316.20	1.25 =+	1.25 =
				45.00 M 1
Returns			48 ×	48. ×
25	1.65	41.25	.75 =+	0.75 =
157		\$274.95		36.00 M 1
			98 ×	98. ×
less 12% discount	32.99		2.40 =+	2.40 =
	\$241.96			235.20 M 1
			(Total Parts) AX	182. F 1
+ 5% tax	12.10		(Total Extensions) ◇	316.20 ◇ 1
+ shipping	8.25		25 ×	25. ×
	\$262.31		1.65 =-	1.65 =
				41.25 M 1
			AX	157. F 1
			*	274.95 * 1
			×	274.95 ×
			12 CS %	12. %
				32.99
			%	241.96 T
			5 %	5. %
				12.10
				254.06 T
			+	254.06 +
			8.25 +	8.25 +
			T	262.31 T

Chain discounts are computed easily. Enter a discount and depress [%] twice to print the first discount and new net. Enter the second percentage and depress [%] once. The calculator will print both the new discount and the new net.

13. CONSTANT PERCENTAGE

SETTINGS: Decimal: 2 ■ RO ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
15% of 110=16.50	15 \times	15. \times
15% of 220=33.00	110 %	110. %
15% of 330=49.50		16.50
660 99.00	220 %	220. %
		33.00
	330 %	330. %
		49.50
	AX	99.00 F 1
	AX	660. F 2
	N	3. N 2

When the percent key is used with a constant, all entries and answers are automatically accumulated. Depressing [AX] once will print the sum of the answers (F₁). Depressing [AX] a second time will print the sum of the entries (F₂).

Also, the accumulation counter will automatically keep track of the number of entries made utilizing the constant. Depressing [N] will print the number of calculations performed.

These accumulations are automatically cleared when a new problem is initiated (when [\times] or [\div] is depressed).

14. ROOTS, POWERS AND LOGS

SETTINGS: Decimal: 2 ■ FL ■ Calc Mode

PROBLEM	KEYBOARD ENTRY	PRINT OUT
1. $\sqrt{25}=5$	25 $\sqrt{}$	25. $\sqrt{}$
		5.
2. $3^8=6561$	3 x^y	3. x^y
	8 =	8. =
		6561.
3. $20^{\frac{1}{3}}=2.714417617$	20 x^y	20. x^y
	3 $1/x$	3. $1/x$
		0.33333333333333
	=	0.33333333333333
		2.714417617
4. Find the natural log of 25	25 $\ln x$	25. LN
		3.218875825
5. Find the natural antilog of 1.23 ($e^{1.23}=3.42$)	1.23 e^x	1.23 e^x
		3.421229536

GENERAL INFORMATION ON CARING FOR YOUR MAGNETIC CARDS

The Rockwell magnetic card is quite durable and will last for years with normal use. Simply keep it clean, don't fold or bend it, and don't allow it to get scratched. Don't put it near a magnet or a magnetic field. (Magnetic fields are found around electrical outlets, particularly if there are several appliances plugged in.)

You may wish to write information on the face of the card, such as the program number and title. If so, do not use a ball point pen as the point may damage the card. Use a soft pencil or a felt tip pen.

After using a magnetic card, do not leave it in the card reader or lying flat on the calculator. Either put it away safely or stand it up in the slot immediately behind the card reader opening.

Magnetic cards can be used as often as you wish. You can use the same program (or data) over and over, or you can change the program (or data) as often as you like. If you have a card with a program (or data) that is no longer valuable and you want to use it to record a new program (or data), simply treat the card as if it were brand new. The old information will be "erased" as new information is recorded on the card.

GENERAL INSTRUCTIONS ON USING MAGNETIC CARDS

SECTION I. LOADING A PROGRAM

This section gives instructions on how to load a program into the calculator from a pre-recorded magnetic card. Follow each step in sequence:

1. Switch the LOAD/TEST/RECORD switch to **LOAD**.
2. Depress [MANUAL].
3. Insert the magnetic card into the card reader opening with side A down and the printed side facing you. The card will be drawn in and returned automatically.
4. Then, if side B has been used, insert the card with side B down (printed side still facing you).
5. Remove the card from the card reader and stand it up in the slot behind the card reader opening or store it in a safe place.

You are now ready to run the program. Each programmer will write programs a little differently, so follow the operating instructions carefully and in the exact order given.



SECTION II. RECORDING A PROGRAM

When the program is already in the calculator, it can be recorded on a magnetic card as follows.

Perform each step in sequence:

1. Switch the LOAD/TEST/RECORD switch to **RECORD**.
2. Depress [MANUAL].
3. Insert the magnetic card into the card reader opening with side A down and the printed side facing you. The card will be drawn in and returned automatically.
4. If the program exceeds 256 steps, insert the card with side B down (printed side still facing you).
5. The program is now recorded on the program card. Store the card in a safe place.

NOTE: Before running the program, you may wish to test the card to be sure it has not been damaged. If so, proceed to the next section.



SECTION III. TESTING A CARD



To run a test on the card, follow each step in sequence:

1. Switch the LOAD/TEST/RECORD switch to **TEST** (the center position).
2. Insert the magnetic card into the card reader opening with side A down and the printed side facing you. The card will be drawn in and returned automatically.
3. If side B has been used, insert the card into the opening with side B down (printed side facing you).

If the card fails the test, an E will print and the keyboard will lock. Depress [CLEAR] to eliminate this condition. You may record and test the card again. If the card fails the test again, use a new card.

SECTION IV. LOADING DATA

Before running a program you may have to input existing data (such as running totals in an inventory program) from a data card.

Follow each step in sequence:

1. Switch the LOAD/TEST/RECORD switch to **LOAD**.
2. Depress [→M/IN].
3. Insert the magnetic card into the card reader opening with side A down and the printed side facing you. The card will be drawn in and returned automatically.
4. If more than 32 memories have been used, insert the card with side B down (printed side facing you).
5. Remove the card from the card reader and stand it up in the slot behind the card reader opening or store it in a safe place.

The data is now transferred to the calculator's memories while still remaining intact on the data card. Any data that was previously held in a memory will be replaced by the number being loaded into that memory from the data card.

SECTION V. RECORDING DATA

Sometimes you will want to save numbers that are in the memories. For instance, you may have a program from which the resulting totals are to be kept for future use. In this case, you would have one card on which the program is stored (the program card) and another on which the data resulting from the program is stored (the data card).

Perform each step in sequence:

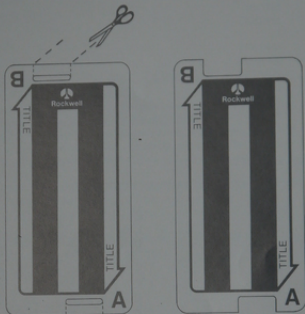
1. Switch the LOAD/TEST/RECORD switch to **RECORD**.
2. Depress [←M/OUT].
3. Insert the magnetic card into the card reader opening with side A down and the printed side facing you. The card will be drawn in and returned automatically.
4. If more than 32 memories have been used, insert the data card with side B down (printed side still facing you).
5. Remove the card and store it in a safe place.

The data will still be intact in the calculator memories. You may continue using these numbers as you wish.

SECTION VI. "NOTCHING" THE MAGNETIC CARD

You may have a program that you want to keep permanently. This may be accomplished by altering the card so that it cannot be erased or recorded over. Simply follow these steps:

1. Record the program (or data) on the magnetic card, then test it to be sure the card isn't defective.
 2. Notch the card as shown in the following illustration. If only side A was used, only side A needs to be notched.
- It will be impossible to erase or change the program or data stored on the side that is notched.



OPERATING A PROGRAM USING MAGNETIC CARDS

In this section you will load a short program to solve $a \times b = c$ into the calculator, record the program on a magnetic card and test the card. Then you will clear the program from the machine, reload it from the magnetic card and, finally, execute the program instructions.

Follow these steps in sequence:

- A. Make sure that the PRINT switch is on and the FL/RO/ \downarrow switch is on RO.
- B. Switch the LOAD/TEST/RECORD switch to LOAD.
- C. Depress [MANUAL], [PROG]. "000 " will print. The indicator above the [PROG] key will illuminate.

D. Key in the following:

[CLEAR ALL]
[SPACE]
[DEC SET]
[2]
[STOP]
[PRINT]
[×]
[STOP]
[PRINT]
[=]
[PRINT]
[SPACE]
[SPACE]
[JUMP]
[0]
[0]
[0]

E. Check your tape. It should look like this:

000.....		
000.....	C A	
001.....	L S	
002.....	D S	
003.....		2
004.....	S T	
005.....	P	
006.....		×
007.....	S T	
008.....	P	
009.....		=
010.....	P	
011.....	L S	
012.....	L S	
013.....	J	
014.....		0
015.....		0
016.....		0

- F. If a wrong key was depressed, return to step C and start over.
- G. When the tape is correct, test the program with the test values given below, as follows:
1. Depress [MANUAL], [RUN].
 2. Enter the first value, 5. Depress [RUN].
 3. Enter the second value, 6. Depress [RUN].
 4. The answer 30.00 should print.
 5. The program will return to step 004 so you can enter new values if you wish.
- H. If the correct answer prints, record the program on a magnetic card (see Section II).
- I. Now test the card by following steps 1 and 2 in Section III.
- J. Clear the program from the machine by depressing [MANUAL], [PROG], [CLEAR], [MANUAL].
- K. Load the program from the magnetic card by following instructions in Section I.
- L. Now you are ready to test the program again. Follow the operating steps given under step G.

ERROR CONDITIONS

Under normal operating conditions the calculator will rarely, if ever, go into an error condition (i.e. prints "E," keyboard locked). If this occurs it is an indication that an improper calculation has been attempted. If you are not sure what is wrong, then consult the following list for an explanation.

I. The following calculations are considered improper. Attempting them will cause an error.

- A. Division by zero
- B. Square root of a negative number
- C. $[x^y]$ if x is negative or zero
- D. $[\ln x]$ if x is negative or zero
- E. $\left[\frac{1}{x}\right]$ if $x=0$

II. The following conditions are beyond the calculator's capacity and will cause an overflow condition. E will print and the keyboard will lock.

- A. Overflow will occur during multiplication or division when a result is greater than or equal to 10^{11} . When this happens, the answer that prints will be correct if multiplied by 10^{11} .
- B. Overflow will occur if you try to add two numbers whose sum is greater than 10^{11} . When this happens, the last number will not be added so that the previous (correct) balance will be undisturbed. For example, if you touch 60,000,000,000,000 $[+]$ 50,000,000,000,000 $[+]$ the calculator will overflow. If you touch $[\text{CLEAR}][\text{T}]$, 60,000,000,000,000 will print.
- C. $[\text{M}+]$, $[\text{M}-]$, $[\rightarrow\text{M}/\text{IN}]$ $[+]$, and $[\rightarrow\text{M}/\text{IN}]$ $[-]$ will cause an overflow if the above conditions are attempted.
- D. Overflow will occur if you try to manually enter a number larger than 10^{11} .
- E. Overflow will occur if e^x produces an answer that is larger than or equal to 10^{11} . The common log of the answer will print.
- F. Overflow will occur if e^x produces an answer larger than 10^{11} . (This will occur when x is greater than 32.236191-301.) The common log of the correct answer will print.

III. The magnetic card:

- A. Loading a data card without first touching $[\rightarrow\text{M}/\text{IN}]$ may cause an error or destroy your program.
- B. Entering a defective magnetic card with the switch set to LOAD or TEST will cause an error condition.

CHANGING THE PAPER ROLL

Appearance of a red paper section indicates the paper supply is running short. Standard tape (2 3/4" in width) should be used as a replacement.

1. Secure paper roll between pressure clamps in back of machine.



3. Push down the paper release lever, and straighten out the paper if necessary. Then insert the paper underneath the plastic guide and out behind the tear-off.

2. Insert paper directly underneath the platen (the thick black rubber roller), then turn the paper feed wheel several times.



4. Push the paper release lever again to bring it back to its original position.

CHANGING THE RIBBON

1. Remove the printing section cover by lifting the back of the cover.

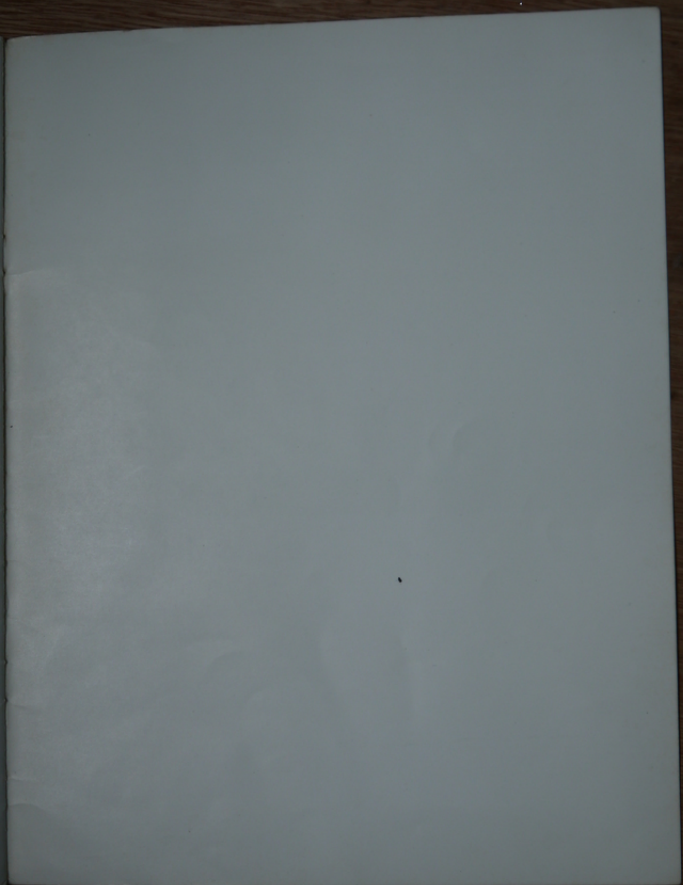



3. Place new cartridge (with blue side of ribbon up) onto spools and drop into place.

2. Flip back the two ribbon guides, pick up the old cartridge and discard.



4. Snap back the two ribbon guides and replace printing section cover.




Rockwell