

**WYLE LABORATORIES**  
**PRODUCTS DIVISION**

**THE WYLE SCIENTIFIC**  
**ELECTRONIC CALCULATOR**

**INSTRUCTION MANUAL**

## INTRODUCTION

The Wyle SCIENTIFIC provides capabilities and features unique in a desk calculator. Some of these features are

- . 3 storage registers - There is no need to write down intermediate results or commonly used constants, such numbers can be stored in one of these registers, and recalled at any time when needed.
- . Automatic decimal alignment - The decimal point is entered at the place where it occurs in the number. The number is positioned automatically. And so are all answers.
- . Full display of registers - The contents of all registers are displayed. Proof of the number just entered is visible and you don't have to remember where you stored a number or what the number was.
- . Correction capability - If any digit of a 24-digit number is entered incorrectly, you can pick out that digit and correct it.

And there are a great many more features, explained in this manual, that make the Wyle SCIENTIFIC the most flexible and powerful calculator you can use.

In spite of this unusual capability, the operation of the Wyle SCIENTIFIC is easy to learn. Operation is straightforward and requires no complex routines or techniques, even for relatively complex operations. The basic operations can be mastered in minutes.

The purpose of this book is to acquaint you with the basic operations of the Wyle SCIENTIFIC. Each key, each function, and each section of the display is explained in full. These examples demonstrate the possible applications and others will become apparent as you use the machine in day-to-day operations.

All keys and registers are explained in detail in the following pages; however, a general explanation of the keyboard and display will acquaint you with what to look for when operating the SCIENTIFIC and will explain some terms that will be used in the following pages.

## Display

The top line of the display is the Multiplier-Quotient Register, abbreviated MQ. This register is used to hold the multiplier in multiplication operations, the quotient in division operations, and the answer in Square Root operations.

The Entry Register holds the multiplicand in multiplication operations, the divisor in division operations, and the minuend in subtraction operations. It is the normal register for data entry and its contents are added to the contents of the Accumulator in the normal addition operation.

The Accumulator Register, abbreviated ACC., is used to hold the original number (radicand) in Square Root operations, the dividend in division operation, and the subtrahend in subtraction operations. The answers to all addition, subtraction, and multiplication operations of all types appear in this register.

The three storage registers are numbered 1, 2 and 3 from top to bottom. Numbers can be transferred to any of these registers from any other register and from any of these registers to any other register. They are used to store constants or intermediate answers which may be required at a later stage in the calculation.

An indicator zero appears on the far left; in the illustration it is shown aligned with the MQ Register. This indicates which register has been selected as the FROM register. When the TRANSFER key is depressed, the contents of the register, the FROM register, will automatically be transferred to the TO register.

In one register, one of the 24 digits will appear unusually bright. This is the register selected as the TO register. In the illustration, this is shown as the initial zero of the Accumulator Register. The position which is shown as bright can be moved right or left by the FORWARD SPACE and BACK SPACE keys. The position of the bright digit indicates the next position for number entry. If the number 2 key were depressed, the bright zero would be converted to a 2, and the next zero to the right would become the bright digit.

The operation of these various keys is explained in detail later in this book, as well as the use of these keys to correct erroneous data already entered.

MQ Register	0	000	000	000	001	414	213	562	373
Entry Register		000	000	000	000	000	000	000	000
ACC. Register	0	000	000	000	000	000	000	000	000
Storage Reg. 1		000	000	000	000	000	000	000	000
Storage Reg. 2		000	000	000	000	000	000	000	000
Storage Reg. 3		000	000	000	000	000	000	000	000

Wyle SCIENTIFIC Visual Display

## Keyboard

The labeling on the various keys is self-explanatory and the remainder of this book is devoted to illustrating the function and application of the keyboard.

For your convenience the keys are grouped by function. The left hand group of keys controls transfer operations, the central group of keys control data entry, and the right hand group of keys control arithmetic operations.

A quick reference list of the basic calculator commands and operations is given on the back cover. Since the notation is used in other places throughout the book, it is explained in the following paragraphs.

As an example, consider the following "shorthand" notation

$$(Entry) + (Acc.) \rightarrow (Acc.)$$

This is read as: The contents of the Entry Register are added to the contents of the Accumulator Register and the results appear in the Accumulator Register. In summary

(Entry) is read as "Contents of the Entry Register"

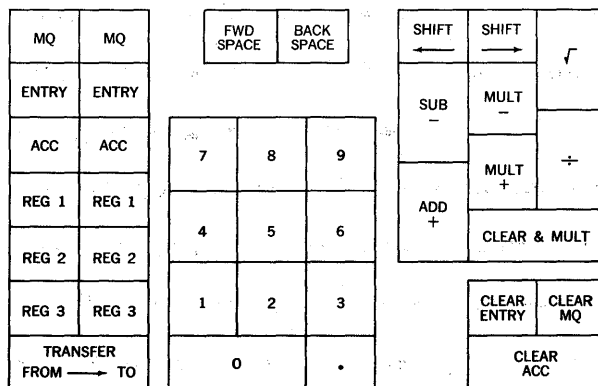
Entry is read as "The Entry Register"

Some additional examples will further clarify this system of notation

$(MQ) \times (Entry) \rightarrow Acc.$  is read "Contents of the MQ Register are multiplied by the contents of the Entry Register and the results appear in the Accumulator Register."

$(Entry) \rightarrow R1$  is read "Contents of the Entry Register are transferred to the Storage Register 1."

$(Acc) - (Entry) \rightarrow Acc.$  is read "Contents of the Entry Register are subtracted from the contents of the Accumulator Register and the difference appears in the Accumulator Register."



Wyle SCIENTIFIC Keyboard

## BASIC OPERATIONS

The following pages describe the basic operations of the Wyle SCIENTIFIC calculator. These are not the arithmetic operations but those operations which allow you to enter numbers into the registers, rearrange the contents of the registers, and prepare the machine for arithmetic operations.

### 1. Data Transfer Operations

Six FROM keys and six TO keys, all located on the left hand side of the keyboard, define the data transfer operations (FROM a selected register TO a selected register). The actual transfer is initiated by the TRANSFER key, located below the TO and FROM keys.

#### Exercise 1

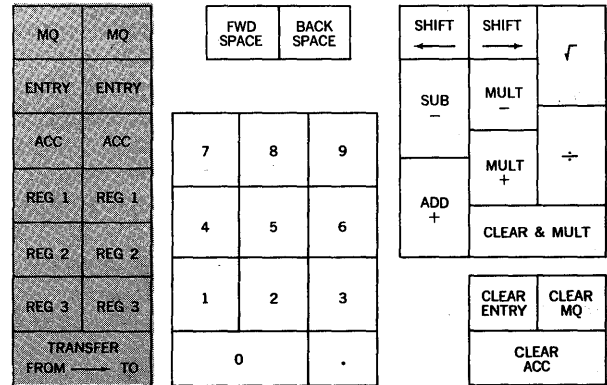
Depress FROM MQ  
 FROM ENTRY  
 FROM ACC  
 FROM R1  
 FROM R2  
 FROM R3

Note the position of the FROM marker at each step (the indicator located at the left hand side of the display).

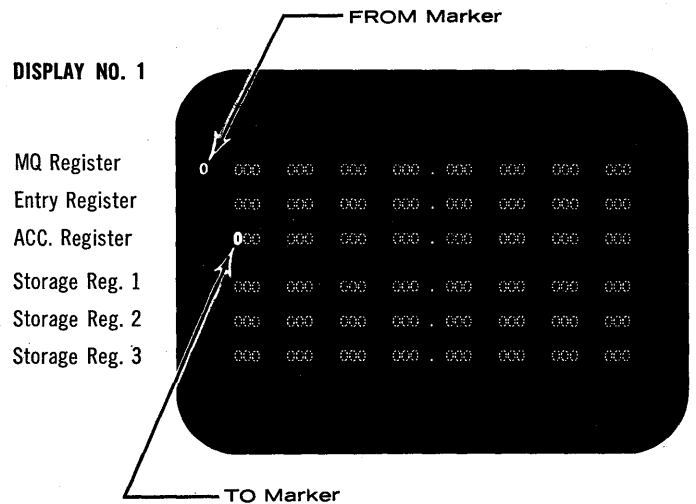
Depress TO MQ  
 TO ENTRY  
 TO ACC  
 TO R1  
 TO R2  
 TO R3

Note the position of the TO marker at each step (the bright digit of the register contents).

(Further transfer exercises are given after the explanation of the Data Entry.)



**KEYBOARD NO. 1**



**Exercise 1**

## 2. Clearing the Registers

The three arithmetic registers (MQ, ENTRY, ACC.) are cleared, that is, the contents are eliminated by means of the three keys located in the lower right hand section of the keyboard. These are labeled

**CLEAR ENTRY**

**CLEAR MQ**

**CLEAR ACC**

and each key eliminates all data in the corresponding register.

To clear Registers 1, 2 and 3, TRANSFER TO the selected register from some other register which is already cleared.

### Exercise 2

Depress **CLEAR MQ**  
**CLEAR ENTRY**  
**CLEAR ACC.**

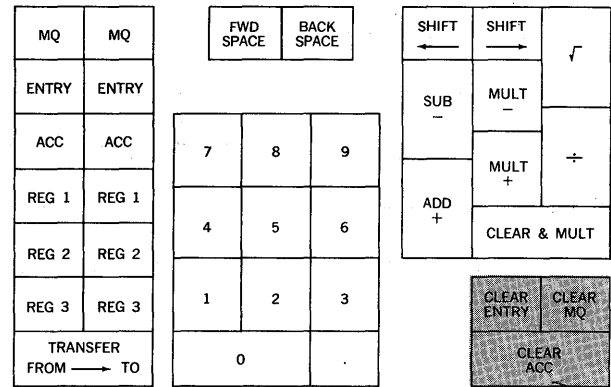
Note that the contents of all three registers are eliminated.

Depress **FROM ACC.**  
**TO REG. 1**  
**TRANSFER**

Note that Register 1 is now cleared.

Depress **TO REG. 2**  
**TRANSFER**  
**TO REG. 3**  
**TRANSFER**

Note that all six registers are now cleared. These operations should be performed slowly so that the marker positions can be noted.



**KEYBOARD NO. 2**

### **DISPLAY NO. 2**

MQ Register	000	000	000	000	000	000	000
Entry Register	000	000	000	000	000	000	000
ACC. Register	0	000	000	000	000	000	000
Storage Reg. 1	0	000	000	000	000	000	000
Storage Reg. 2	000	000	000	000	000	000	000
Storage Reg. 3	000	000	000	000	000	000	000

**Exercise 2:** TO and FROM Markers for transferring zeros from ACC to REG. 1

### 3. Data Entry

Numerical data is entered via the numerical keys located in the center of the keyboard. Data will appear in the selected TO register. The TO register is identified by the TO marker and the position of this marker indicates the position where the next digit will be entered.

Numbers are entered exactly as read, including the decimal point. As an example, the following steps:

- Depress
- 4 KEY
  - 3 KEY
  - 5 KEY
  - DECIMAL POINT (.) KEY
  - 0 KEY
  - 1 KEY
  - 4 KEY

will place 435.014 in the selected TO register, properly aligned about the preselected decimal point.

#### Exercise 3

- Depress
- TO ENTRY
  - 2
  - (.)

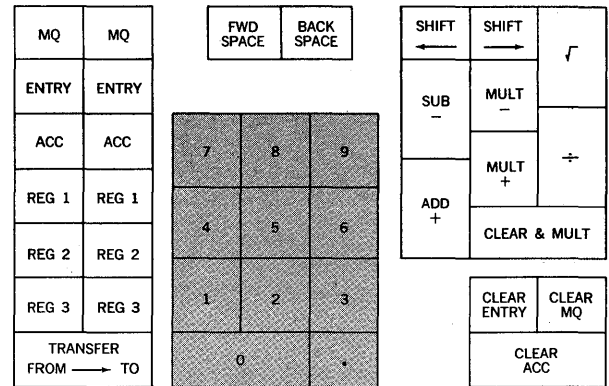
Note position of number 2 in ENTRY REGISTER.

- Depress
- TO ACC.
  - (.)
  - 2

Note position of number .2 in ACC. REGISTER.

- Depress
- TO MQ
  - 2
  - (.)

Note position of the digit 2 in the various registers and the fact that the TO marker indicates the position of the next digit to be entered.



KEYBOARD NO. 3

#### DISPLAY NO. 3

MQ Register            000 000 000 000 . 000 000 000 000  
 Entry Register        000 000 000 002 . 000 000 000 000  
 ACC. Register        0 000 000 000 000 . 000 000 000 000  
 Storage Reg. 1        000 000 000 000 . 000 000 000 000  
 Storage Reg. 2        000 000 000 000 . 000 000 000 000  
 Storage Reg. 3        000 000 000 000 . 000 000 000 000

Exercise 3: Number 2. entered into ENTRY Register

Exercise 4

Depress CLEAR MQ  
 CLEAR ENTRY  
 CLEAR ACC  
 TO ENTRY  
 ENTER 123.456  
 FROM ENTRY  
 TO ACC.  
 Depress TRANSFER  
 TO REG. 1  
 TRANSFER

Perform this series of operations slowly, noting the positions of the TO marker and FROM marker. Learning to interpret the status of the machine from the positions of these markers can save time and unnecessary operations.

4. FORWARD and BACK Space

The FORWARD and BACK space keys, located in the top center section of the keyboard, position the TO marker one digit at a time. This enables you to correct an erroneous entry without re-entering the data.

Exercise 5

Clear all Registers

Depress TO ENTRY  
 Enter 999.999  
 Depress FORWARD space 5 times  
 Depress BACK space 7 times

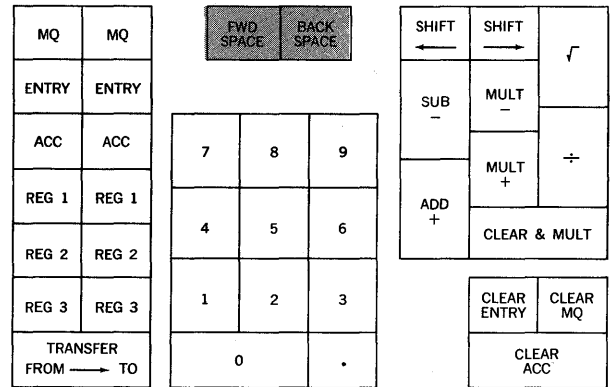
Note the position of the TO marker as the Forward space and Back space keys are depressed.

Now, enter the digit 5. (Do not depress the decimal point key.) Note that the number which was intensified has changed to 5 and the next digit is now the bright position.

DISPLAY NO. 4

MQ Register 000 000 000 000 . 000 000 000 000  
 Entry Register 0 000 000 000 123 . 456 000 000 000  
 ACC. Register 0 000 000 000 000 . 000 000 000 000  
 Storage Reg. 1 000 000 000 000 . 000 000 000 000  
 Storage Reg. 2 000 000 000 000 . 000 000 000 000  
 Storage Reg. 3 000 000 000 000 . 000 000 000 000

Exercise 4: Prior to first transfer operation



KEYBOARD NO. 4

DISPLAY NO. 5

MQ Register 000 000 000 000 . 000 000 000 000  
 Entry Register 000 000 000 999 . 999 000 000 000  
 ACC. Register 0 000 000 000 000 . 000 000 000 000  
 Storage Reg. 1 000 000 000 000 . 000 000 000 000  
 Storage Reg. 2 000 000 000 000 . 000 000 000 000  
 Storage Reg. 3 000 000 000 000 . 000 000 000 000

Exercise 5: Prior to entering digit 5 in place of digit 9



5. Shift Left and Shift Right

These keys move the entire number in the selected TO register to either the left or right, one space each time the keys are depressed.

Exercise 6

Enter 1.25 in Reg. 3

Depress SHIFT LEFT five times

Depress SHIFT RIGHT six times

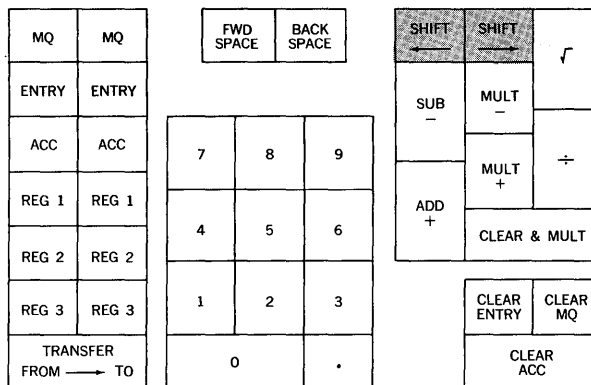
Perform these operations slowly and note the change of position of the number in Register 3.

6. Decimal Point

The Wyle SCIENTIFIC handles the decimal point automatically; however, as a convenience, the decimal point may be positioned in steps of three digits. This permits calculations using numbers through the range between a 3-digit whole number with a 21-digit fraction and a 21-digit whole number with a 3-digit fraction.

Exercise 7

Rotate the decimal point switch so decimal point moves throughout its range. Return to mid-point position 12, and leave in this position. The decimal point switch is located at the bottom of the case, directly beneath the display.



KEYBOARD NO. 5

DISPLAY NO. 6

MQ Register	000	000	000	000	.	000	000	000	000
Entry Register	000	000	000	000	.	000	000	000	000
ACC. Register	0	000	000	000	.	000	000	000	000
Storage Reg. 1	000	000	000	000	.	000	000	000	000
Storage Reg. 2	000	000	000	000	.	000	000	000	000
Storage Reg. 3	0	000	125	000	.	000	000	000	000

Exercise 6: At end of SHIFT LEFT operations

## MATHEMATICAL OPERATIONS

The next section describes the arithmetic operations; the steps used in actual calculations. Before studying these operations you should be fully acquainted with the basic manipulations described in the preceding section.

### 7. Addition

When the ADD (+) key is depressed, the contents of the ENTRY register are added to the contents of the ACCUMULATOR. The sum appears in the ACCUMULATOR.

In symbolic notation:

$$(\text{Entry}) + (\text{Acc}) \rightarrow \text{ACC}$$

#### Exercise 8

Clear all Registers

Depress TO ENTRY

Enter 12.

Depress ADD (+)

(12 + 0 appears in ACC.)

Enter 13.

Depress ADD (+)

Note that the sum (25) appears in the ACC.

### 8. Subtraction

When the SUB key is depressed, the contents of the ENTRY register are subtracted from the contents of the ACCUMULATOR register and the difference appears in the ACCUMULATOR. In symbolic notation:

$$(\text{Acc}) - (\text{Entry}) \rightarrow \text{ACC.}$$

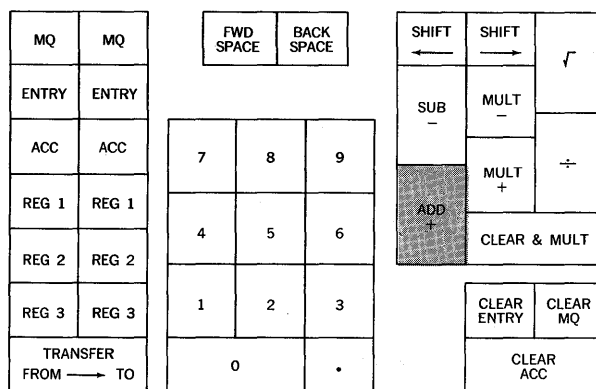
#### Exercise 9

Do NOT clear registers. Retain all answers from previous exercises. (25 in ACC.)

Enter 18.

Depress SUB (-) key

Note: 25 - 18 = 7 appears in ACC.

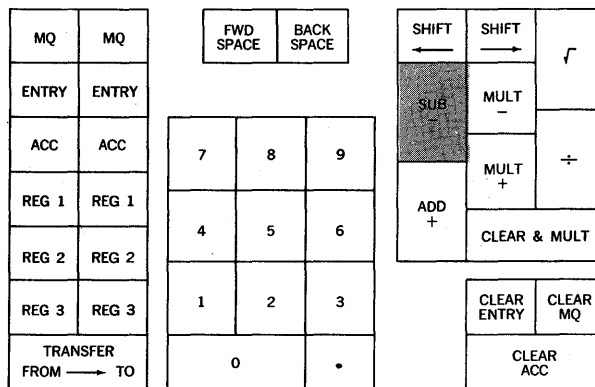


KEYBOARD NO. 6

#### DISPLAY NO. 7

MQ Register	000	000	000	000	000	000	000
Entry Register	000	000	000	013	000	000	000
ACC. Register	0	000	000	012	000	000	000
Storage Reg. 1	000	000	000	000	000	000	000
Storage Reg. 2	000	000	000	000	000	000	000
Storage Reg. 3	000	000	000	000	000	000	000

#### Exercise 8: Prior to depressing ADD (+) Key



KEYBOARD NO. 7

#### DISPLAY NO. 8

MQ Register	000	000	000	000	000	000	000
Entry Register	000	000	000	018	000	000	000
ACC. Register	0	000	000	025	000	000	000
Storage Reg. 1	000	000	000	000	000	000	000
Storage Reg. 2	000	000	000	000	000	000	000
Storage Reg. 3	000	000	000	000	000	000	000

#### Exercise 9: Prior to depressing SUBTRACT (-) Key

**9. CLEAR and MULTIPLY**

Depressing this key first clears the ACC to zero and then adds into the ACC register the product of the number in the ENTRY Register and the number in the MQ register.

In symbolic notation:

$$(MQ) \times (ENTRY) \rightarrow ACC.$$

**Exercise 10**

- Depress TO MQ
- Enter 15.
- Depress TO ENTRY
- Enter 16.
- Depress CL & MULT.

The product appears in the ACC and 15, the multiplier, remains in the MQ.

- Enter 7.
- Depress CL & MULT.

The product 105 (15 x 7) appears in the ACC.

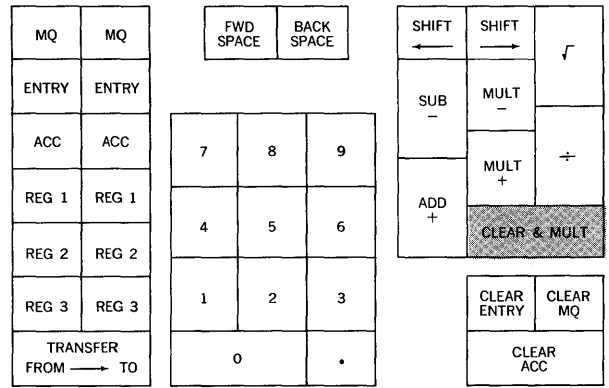
**10. MULTIPLY and ADD**

Depressing the MULT.+ key adds the product of the contents of the ENTRY register and the contents of the MQ register to the contents of the ACC register. The answer appears in the ACC register. In symbolic notation:

$$(ACC) + [(MQ) \times (ENTRY)] \rightarrow ACC.$$

**Exercise 11**

- Enter 8.
- Depress MULT.+
- The product 120 (15 x 8) is added to the ACC (105) giving 225 in the Accumulator.

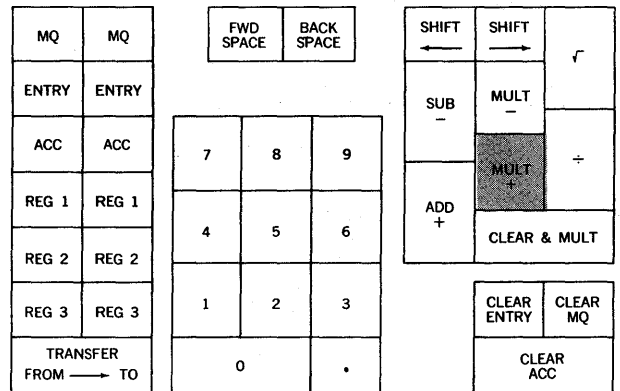


**KEYBOARD NO. 8**

**DISPLAY NO. 9**

MQ Register 000 000 000 15 . 000 000 000 000  
 Entry Register 000 000 000 16 . 000 000 000 000  
 ACC. Register 0 000 000 000 000 . 000 000 000 000  
 Storage Reg. 1 000 000 000 000 . 000 000 000 000  
 Storage Reg. 2 000 000 000 000 . 000 000 000 000  
 Storage Reg. 3 000 000 000 000 . 000 000 000 000

**Exercise 10: Prior to depressing CLEAR & MULT Key**



**KEYBOARD NO. 9**

**DISPLAY NO. 10**

MQ Register 000 000 000 15 . 000 000 000 000  
 Entry Register 000 000 000 8 . 000 000 000 000  
 ACC. Register 0 000 000 000 105 . 000 000 000 000  
 Storage Reg. 1 000 000 000 000 . 000 000 000 000  
 Storage Reg. 2 000 000 000 000 . 000 000 000 000  
 Storage Reg. 3 000 000 000 000 . 000 000 000 000

**Exercise 11: Prior to depressing MULT + Key**

**11. MULTIPLY and SUBTRACT**

Depressing the **MULT. -** key multiplies the contents of the MQ register by the contents of the ENTRY register and subtracts the product from the contents of the ACC register. The answer appears in the ACC register. In symbolic notation:

$$(ACC) - [(MQ) \times (ENTRY)] \rightarrow ACC$$

**Exercise 12**

Enter 8.

Depress **MULT. -**

The product 120 (15 x 8) is subtracted from the ACC (225) giving 105 in the ACC.

**12. DIVIDE**

Depressing the **÷** key divides the contents of the ACC register by the contents of the ENTRY register. The answer (quotient) appears in the MQ register. In symbolic notation:

$$(ACC) \div (ENTRY) \rightarrow MQ$$

**Exercise 13**

Depress **CLEAR ACC**

Depress **TO ACC**

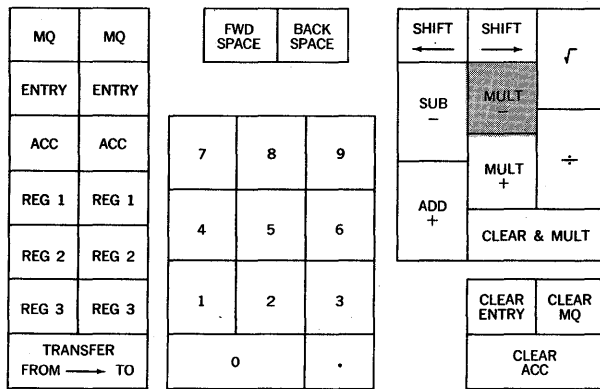
Enter 144.

Depress **TO ENTRY**

Enter 13.

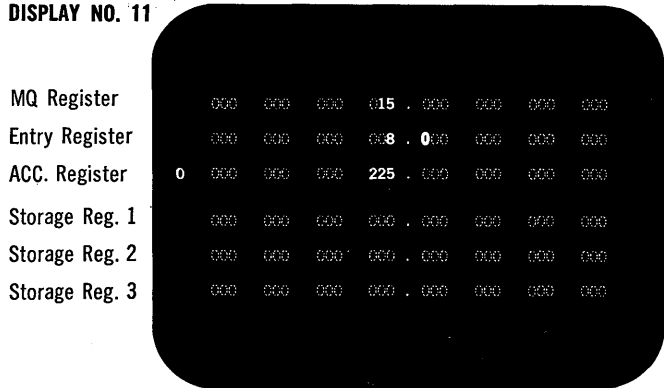
Depress **DIVIDE (÷)**

The quotient 11.076 923 076 923 appears in the MQ register. The divisor (13) remains in the ENTRY register.

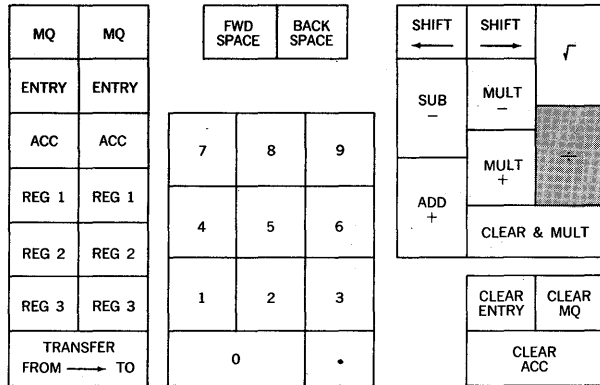


**KEYBOARD NO. 10**

**DISPLAY NO. 11**

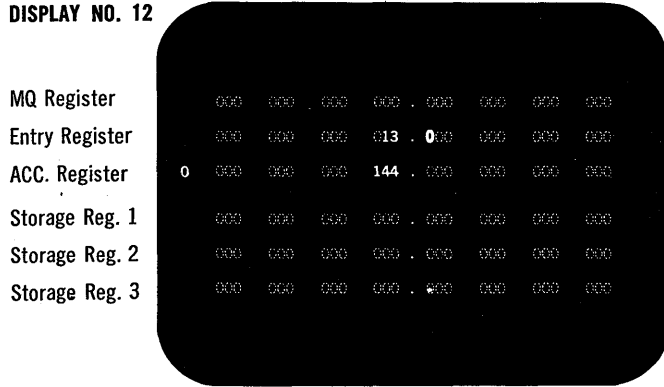


**Exercise 12: Prior to depressing MULT (-) Key**



**KEYBOARD NO. 11**

**DISPLAY NO. 12**



**Exercise 13: Prior to depressing (÷) Key**

13. SQUARE ROOT

Depressing the  $\sqrt{\quad}$  key takes the square root of the contents of the ACC register and places the answer in the MQ register. In symbolic notation:

$$\sqrt{(ACC.)} \rightarrow MQ$$

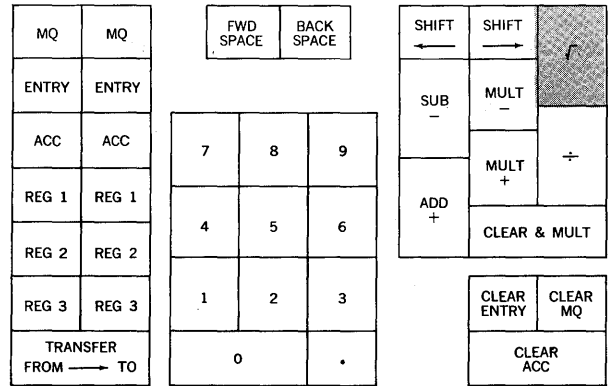
Exercise 14

Depress **TO ACC**

Enter **2.**

Depress  $\sqrt{\quad}$

1.414--- ( $\sqrt{2}$ ) appears in MQ.



KEYBOARD NO. 12

DISPLAY NO. 13

MQ Register	000	000	000	000	.	000	000	000
Entry Register	000	000	000	000	.	000	000	000
ACC. Register	0	000	000	000	.	002	000	000
Storage Reg. 1	000	000	000	000	.	000	000	000
Storage Reg. 2	000	000	000	000	.	000	000	000
Storage Reg. 3	000	000	000	000	.	000	000	000

Exercise 14: Prior to depressing  $\sqrt{\quad}$  Key

**14. TRANSFER**

Depressing the TRANSFER key will transfer the contents of the selected FROM register to the selected TO register. (See Section 1.)

**Exercise 15**

Depress FROM MQ  
TO REG. 1  
TRANSFER

The contents of the MQ (1.414) is in Reg. 1. The contents of the MQ is unchanged.

Depress TO ENTRY  
TRANSFER

1.414 is now in ENTRY and MQ.

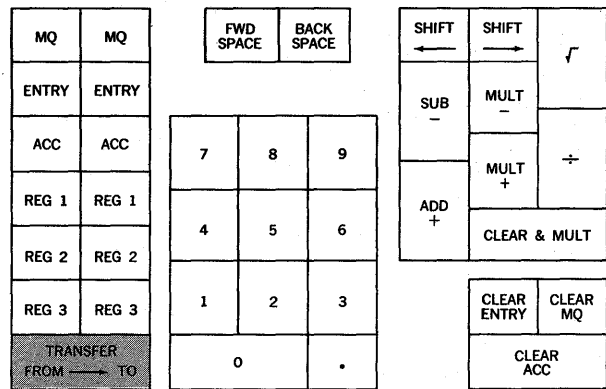
Depress CL & MULT.

$\sqrt{2} \times \sqrt{2}$  is now in the Accumulator.

With the decimal point in the center position the ACC should read

1.999 999 999 987

This routine may be used as a quick check of proper equipment operation.



**KEYBOARD NO. 13**

**DISPLAY NO. 14**

MQ Register 0 000 000 000 001 . 414 213 562 373  
 Entry Register 000 000 000 000 . 000 000 000 000  
 ACC. Register 000 000 000 000 . 000 000 000 000  
 Storage Reg. 1 000 000 000 000 . 000 000 000 000  
 Storage Reg. 2 000 000 000 000 . 000 000 000 000  
 Storage Reg. 3 000 000 000 000 . 000 000 000 000

**Exercise 15:** Prior to TRANSFER of  $\sqrt{2}$  to REG. 1

**DISPLAY NO. 15**

MQ Register 0 000 000 000 001 . 414 213 562 373  
 Entry Register 000 000 000 000 . 000 000 000 000  
 ACC. Register 000 000 000 001 . 999 999 999 987  
 Storage Reg. 1 000 000 000 001 . 414 213 562 373  
 Storage Reg. 2 000 000 000 000 . 000 000 000 000  
 Storage Reg. 3 000 000 000 000 . 000 000 000 000

**Exercise 15:** After completion of all operations

## SPECIAL OPERATIONS

The preceding sections have described those operations which must be mastered to use the Wyle SCIENTIFIC with a degree of competence. This section describes operations which are useful in more complex problems and which extend appreciably the capabilities of the calculator.

### 15. ADD FROM ANY REGISTER

When this switch is in the "on" (up) position, the contents of the selected FROM register may be added to or subtracted from the contents of the ACC register. In the "off" (down) position, only the contents of the ENTRY register can be added to or subtracted from the contents of the ACC register.



KEYBOARD NO. 14

#### Exercise 16

Clear all Registers.

Place ADD FROM ANY REG. key in "on" position.

Depress TO ACC.

Enter 25.

Depress TO R1

Enter 18.

Depress FROM R1

Depress ADD

25 + 18 = 43 appears in ACC.

Note: Contents of R1 added to contents of ACC.

Answer appears in ACC. (R1) + (ACC) → ACC.

Depress TO MQ

Enter 13.

Depress FROM MQ

Depress SUB

43 - 13 = 30 appears in ACC.

Note: Contents of MQ subtracted from contents of ACC.

Answer appears in ACC. (ACC) - (MQ) → (ACC)

#### DISPLAY NO. 16

MQ Register	000	000	000	000	000	000	000
Entry Register	000	000	000	000	000	000	000
ACC. Register	000	000	000	025	000	000	000
Storage Reg. 1	0	000	000	018	000	000	000
Storage Reg. 2	000	000	000	000	000	000	000
Storage Reg. 3	000	000	000	000	000	000	000

Exercise 16: Prior to adding (REG. 1) + (ACC)

#### DISPLAY NO. 17

MQ Register	0	000	000	013	000	000	000
Entry Register	000	000	000	000	000	000	000
ACC. Register	000	000	000	043	000	000	000
Storage Reg. 1	000	000	000	018	000	000	000
Storage Reg. 2	000	000	000	000	000	000	000
Storage Reg. 3	000	000	000	000	000	000	000

Exercise 16: Prior to subtracting (ACC) - (MQ)

16. OVERFLOW

When the "Overflow Lock Off" switch is in the "off" (up) position, the overflow lockout is inhibited. Overflow normally occurs when the answer to an operation exceeds the capacity of the machine, as for example, when two seven digit numbers are multiplied together with the decimal in the center position (only 12 digits available for product). Overflow indication consists of all digits in the display intensified, plus a line of zeros at the far right edge of the display. Overflow unlocked by depressing the TO ACC (or any "TO" key). The problem may be repeated after moving the decimal point appropriately.

Exercise 17

Multiply 786 357 1. by 843 621 1. with decimal point set at middle position. Overflow occurs. The correct answer is 66 338 036 448 091, obtained by moving the decimal point 3 places to the right and repeating the operation. With the decimal point in the center position and overflow lock off, repeat the multiplication. The answer in the Accumulator is incorrect.

This exercise shows that the overflow lock should be "on" (down) when performing large number operations. It should be "off" only under conditions shown in Step 17A.

Perform Exercise 17A with Overflow Lock "ON" (down).



KEYBOARD NO. 15

DISPLAY NO. 18

MQ Register	0	000	007	863	571	.000	000	000	000	0
Entry Register	436	211	000	000	.000	000	000	000	000	0
ACC. Register	000	000	000	000	.000	000	000	000	000	0
Storage Reg. 1	000	000	000	000	.000	000	000	000	000	0
Storage Reg. 2	000	000	000	000	.000	000	000	000	000	0
Storage Reg. 3	000	000	000	000	.000	000	000	000	000	0

Exercise 17: Overflow indication



### Exercise 17A

Clear MQ, ENTRY and ACCUMULATOR

Depress TO ENTRY

Enter 15.

ADD

Enter 16.

SUBTRACT

The Accumulator contains the tens complement of the Answer -1.

Enter 2.

ADD

The machine overflows since we were adding 2. to 999 999 999 999.

Repeat this exercise with Overflow Lock "Off" (up).

The correct answer (-1. + 2. = 1.) appears in the Accumulator.

The example illustrates that the Overflow Lock, when off, permits ADD and SUBTRACT, and both negative and positive cumulative multiplication operation in the negative number region, the answer being in true form if it is positive and in tens complement form if it is negative.

### 17. COMPLEMENTING

When the answer is in complement form (negative) the re-complementing operation is as follows. Perform Exercise 17A up to the first subtraction, then perform Exercise 18.

DISPLAY NO. 19

MQ Register	000 000 000 000 . 000 000 000 000 0
Entry Register	000 000 000 000 . 000 000 000 000 0
ACC. Register	000 000 000 001 . 000 000 000 000 0
Storage Reg. 1	000 000 000 000 . 000 000 000 000 0
Storage Reg. 2	000 000 000 000 . 000 000 000 000 0
Storage Reg. 3	000 000 000 000 . 000 000 000 000 0

Exercise 17A: Overflow on adding 2. to 999 999 999 999 (the tens complement of -1)

Exercise 18

Depress FROM ACC  
 TO ENTRY  
 TRANSFER  
 CLEAR ACC  
 SUBTRACT

The correct answer 1. appears in the ACC. It should be remembered that it is negative.

18. KEEP REMAINDERS

When the "Keep Remainder" switch is "on" (up) 10 times the remainder of a division operation is retained in the accumulator register. Also, twice the root is retained in the Entry register after a square root operation, as well as 10 times the true remainder. For example, with Keep Remainder "on", perform Exercise 19.

Exercise 19

Depress CLEAR ACC  
 Depress TO ACC  
 Enter 144.  
 Depress TO ENTRY  
 Enter 13.  
 Depress DIVIDE ( $\div$ )

The quotient, 11.076 923 076 923 appears in the MQ register. The remainder X10 appears in the ACC register.

Depress TO ACC  
 Depress SHIFT RIGHT  
 Depress DIVIDE ( $\div$ )

The digits to the right of the decimal are additional digits of the quotient. This operation may be continued indefinitely for any precision of division that may be required.

DISPLAY NO. 20

MQ Register	000	000	000	000	000	000	000
Entry Register	999	999	999	999	000	000	000
ACC. Register	0	000	000	000	000	000	000
Storage Reg. 1	000	000	000	000	000	000	000
Storage Reg. 2	000	000	000	000	000	000	000
Storage Reg. 3	000	000	000	000	000	000	000

Exercise 18: Prior to final subtract (-) operation



KEYBOARD NO. 16

DISPLAY NO. 21

MQ Register	000	000	000	011	076	923	076	923
Entry Register	000	000	000	013	000	000	000	000
ACC. Register	0	000	000	010	000	000	000	000
Storage Reg. 1	000	000	000	000	000	000	000	
Storage Reg. 2	000	000	000	000	000	000	000	
Storage Reg. 3	000	000	000	000	000	000	000	

Exercise 19: Result of division ( $\div$ ) operation showing quotient, divisor and remainder x 10

18A. FOR SQUARE ROOT, operation is similar.

Exercise 19A

Depress **TO ACC**

Enter **2.**

Depress 

$\sqrt{2}$  appears in MQ.

$2 \times \sqrt{2}$  appears in the ENTRY.

The remainder appears in ACC.

Depress **SHIFT RIGHT**

Depress **÷**

Digits to the right of the decimal point in MQ are the next significant digits of the root. In this case, only one division operation is valid.

19. MULTIPLE OPERATIONS

In this type of operation, various keys may be operated simultaneously providing a flexible solution to some problems.

19A. Entering two Registers at the same time is accomplished by depressing two TO keys simultaneously.

Exercise 20

Depress **TO MQ, TO ENTRY**, simultaneously.

Enter **5.**

Depress **MULT.+**

$(5 \times 5) = 25$  appears in ACC Register.

Only three registers can be entered simultaneously.

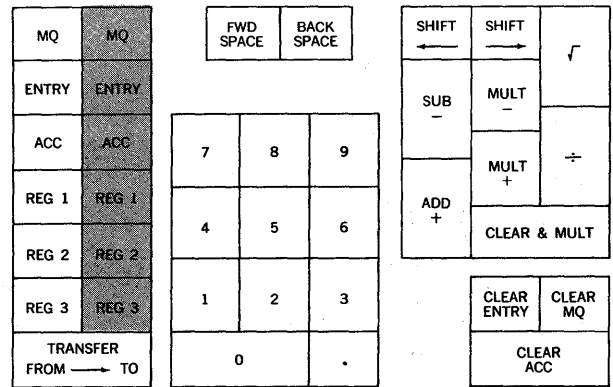
Only one of these can be a storage register.

This concludes the explanation of the operation of the Wyle SCIENTIFIC electronic calculator. With these operations clearly in mind, real mastery of the machine is only a matter of practice.

**DISPLAY NO. 22**

MQ Register	000	000	000	001	. 414	213	562	373
Entry Register	000	000	000	002	. 828	427	124	746
ACC. Register	0	000	000	002	. 688	386	088	714
Storage Reg. 1	000	000	000	000	. 000	000	000	000
Storage Reg. 2	000	000	000	000	. 000	000	000	000
Storage Reg. 3	000	000	000	000	. 000	000	000	000

**Exercise 19A:** Result of  $\sqrt{\quad}$  operation showing  $\sqrt{2}$  in MQ,  $2 \times \sqrt{2}$  in ENTRY, remainder in ACC.



**KEYBOARD NO. 17**

**DISPLAY NO. 23**

MQ Register	000	000	000	005	. 000	000	000	000
Entry Register	000	000	000	005	. 000	000	000	000
ACC. Register	0	000	000	000	. 000	000	000	000
Storage Reg. 1	000	000	000	000	. 000	000	000	000
Storage Reg. 2	000	000	000	000	. 000	000	000	000
Storage Reg. 3	000	000	000	000	. 000	000	000	000

**Exercise 20:** Prior to depressing **CLEAR & MULT** Key (Note two bright TO Markers)

Please observe the following precautions in using the Wyle SCIENTIFIC electronic calculator.

1. Keep dust cover on calculator when machine is not in use.
2. Do not place dust cover on calculator when machine is turned on. This blocks air flow to the machine and the internal rise in temperature may damage circuits.
3. Do not lift or move the calculator while it is running. After turning the calculator off, allow two minutes before lifting or moving. Failure to observe these precautions may damage the memory disc.
4. Remove and clean the air filter (located on the bottom of the calculator) every three months. Use vacuum cleaner or wash with soap and water. Be sure filter is dry before replacing it in the calculator.

If your calculator does not operate properly, check the following possibilities.

1. If cooling fan is not running
  - a. Check AC line cord and plug.
  - b. Check AC outlet.
  - c. Check calculator fuse (on back of calculator case).
2. If cooling fan is running but there is no display
  - a. Be sure either a jumper plug or some input/output device is plugged into I/O socket on back of calculator case.
3. If display is bright but numbers cannot be entered from keyboard
  - a. Check if any key is stuck down.
  - b. Machine may be locked in overflow. Press any TO key to resume normal operation.

If machine cannot be made to operate, contact the nearest Wyle Laboratories representative immediately. Do not remove the calculator case. Any unauthorized attempt to repair calculator malfunctions will void the warranty.

## SUMMARY OF OPERATIONS

### NORMAL OPERATING CONDITIONS

1. Decimal point in center (12th) position.
2. "Overflow Lock" Switch on (down).
3. "Add From Any Register" switch off.
4. "Keep Remainders" switch off.

### ARITHMETIC OPERATIONS

- |                       |                             |        |      |
|-----------------------|-----------------------------|--------|------|
| 1. Addition           | (ACC.) + (Entry)            | —————→ | ACC. |
| 2. Subtraction        | (ACC.) - (Entry)            | —————→ | ACC. |
| 3. Clear and Multiply | (MQ) X (Entry)              | —————→ | ACC. |
| 4. Multiply +         | (ACC.) + [ (MQ) X (Entry) ] | —————→ | ACC. |
| 5. Multiply -         | (ACC.) - [ (MQ) X (Entry) ] | —————→ | ACC. |
| 6. Divide             | (ACC.) ÷ (Entry)            | —————→ | MQ   |
| 7. Square Root        | $\sqrt{(ACC.)}$             | —————→ | MQ   |