



Decimal point setting

Accumulating register keys

Reduced keyboard

Reading keys for operational registers

IME 26

instruction manual

Clearance of operational registers

Keyboard correction

IME 26

An ideal calculator

The IME 26 is the outcome of many year's experience in the construction of electronic desk calculators. It is an ideal combination satisfying two important basic requirements for a calculator: high performance and simple operation. All four basic operations can be carried out with the small number of keys in the central zone of the keyboard; these are positioned in a logical manner, so that the calculator can be operated « blind ».

It should also be emphasized that in addition to the accumulating register three further operational registers are provided, enabling the last operation in each case to be recalled for verification or further processing.

The IME 26 was specially designed for all commercial arithmetical problems. Its electronic system provides a hitherto unattained degree of reliability in calculation.

The IME 26 is equipped with reliable semi-conductors and with interchangeable component boards. The individual component boards are connected by plugs and can easily be replaced.

Index

Characteristics

- Keyboard
- Connection to power
- Capacity
- Entering of data
- Re-utilization of results
- Rounding off of results
- Clearing

Basic Operations

- Addition and Subtraction
- Addition and Subtraction with repeated addends
- Multiplication
- Division
- Raising to a power
- Chain operations
- Accumulation in the auxiliary register
- Constant Factor Operations
- Inverse Value calculations

Examples of applications

- Percentage analysis
- Calculation of depreciation
- Calculation of percentage increase
- Interest calculation
- Interest calculation on bank account
- Amortization rates
- Loan repayment
- Invoicing
- Evaluation of polynomial

Characteristics

The Keyboard

The IME 26 keyboard has a functional and modern design. The ten keys by which all figures are entered and the keys for the fundamental operations are gathered together on an anodized aluminium back plate. The other keys are located in a practical and logical manner.

Reading keys for Operation Register

- A** This key displays the contents of the 1st operation register without clearing it
- B** This key displays the contents of the entering register without clearing it
- T** This key displays the contents of the result register without clearing it

Clearing keys

- C** Initial clear key
- CK** Displayed-register clear key

Keys for the fundamental operations

- Sign change key for any number in display
- X** Multiplication key
- :** Division key
- Operation key for algebraic sums, multiplications and divisions.
In additions the total or sub-total will appear after a second depression of this key.

Keys for Auxiliary Register

The auxiliary register is controlled by three aligned keys.

- C** The central key clears the register
- M** The key on the right displays the register contents without clearing
- The key on the left automatically accumulates in the register the data on display or the results of operations already entered in the operative registers.
The presence of data in the auxiliary registers is indicated by a white band which appears automatically on the central key upon the depression of the register operation key.

Decimal point selector

Controls the decimal point position, which can be selected as desired.

Connection to power

The IME 26 can operate with a voltage variation of $\pm 10\%$ with respect to the nominal value.

If the voltage value is not available it is necessary to interpose an autotransformer of 60 VA at least.

To begin operating the machine, after switching it on, it is sufficient to press the **C** key twice and then the clearing key of the auxiliary memory.

Capacity

The IME 26 has a capacity of 12 digits in all registers. This means that operations such as follows may be performed:

$$999999 \times 999999 = 999998000001$$
$$9999999999 \times 9 = 899999999991$$

By virtue of the automatic control of the decimal point and of the automatic discarding of the excessive decimal digits it is possible to perform calculations such as:

$$15.4764213277 \times 2.2744731219 = 35.2007043331$$

without exceeding the machine capacity, the last digit of the result is automatically rounded off.

Any overflow of the machine capacity is indicated, for any operation, by the lighting of a red lamp on the right of the display. The result which appears under this condition on the display is meaningless.

Entering of data

The numbers entered on the keyboard are stored in the entering register.

For negative numbers press the **-** key after entry. **IME 26 executes algebraic calculations** and each register records the sign.

For decimal numbers press the **.** key after entering the unit digit.

The IME 26 operates with an automatically fixed decimal point in each operation, however the position of the decimal point is adjustable in any position between the 1st and 10th digit by means of the proper selector.

In the event of an error in entry, press the **CK** key and re-enter.

It is possible to completely modify or substitute either the integral or decimal portion of a number leaving the other portion unchanged.

For the decimal portion, it is necessary to press the **.** key and enter again the decimal digits.

For the integral portion, it is necessary to press the **B** key and as often as necessary the **0** key to make the number disappear on the left of the display; this accomplished, the number is entered again correctly.

Re-utilization of results

Each result or factor of any calculation on display may be immediately utilized for successive operations without the necessity of a transfer operation.

Rounding off of results

If the effective number of decimals exceeds the machine capacity, the IME 26 automatically rounds off the last digit either upwards or downwards. Operating with the decimal point in second position, for example, we have:

$$12.6 \times 147.78 = 1862.03$$

With the decimal point in third position instead, we have:

$$12.6 \times 147.78 = 1862.028$$

Clearing

Clearing of the contents of the entering register **[B]** is automatic with each new entering.

Clearing of the other operative registers takes place automatically as is necessary.

Clearing of the auxiliary register is performed by means of the appropriate key.

Basic operations

Addition and subtraction

$$1.23 - 4.5 + 23.757 + 74.6 = 95.087$$

Decimal point in 3rd position

1.23		█
4.5	-	█
23.757		█
74.6		█
█		95.087

The total is obtained by pressing the █ key after the last addition.

By pressing the **A** key after the addition key, it is possible to re-read the last item added. This allows the execution of operations with repeated addends (as indicated in the following example), or allows the correction of that entry by merely changing the sign.

Addition and subtraction with repeated addends

$$1.47 + 1.59 + 1.59 + 1.59 + 0.274 = 6.514$$

Decimal point in 3rd position

	1.47	█
	1.59	█
A	1.590	█
A	1.590	█
	.274	█
█		6.514

Multiplication

a) $15.42 \times 7.23 = 111.487$

Decimal point in 3rd position

	15.42	█
	7.23	
█		111.487

By pressing **A** and **B** keys, multiplicand and multiplier may be re-read, each one with its correct algebraic sign.

By pressing the **T** key, the product may be re-read.

b) $-5.36 \times 2.43 = -13.025$

Decimal point in 3rd position

5.36	=	X
2.43		
█		-13.025

Division

$13 : 3 = 4.333$

Decimal point in 3rd position

13	:	
3		
█		4.333

By pressing the **A** key the division remainder (0.001) may be read.

By pressing the **B** key the divisor (3) may be read.

By pressing the **T** key we return to read the quotient.

Raising to a power

$(-1.018)^5 = -1.093$

Decimal point in 3rd position.

1.018	=	○
M -1.018	X	
M -1.018	X	
M -1.018	X	
M -1.018	X	
M -1.018		
█		-1.093

or

	1.018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
A	— 1.018		
[REDACTED]	1.036		
A	— 1.018		<input checked="" type="checkbox"/>
T	1.036		
[REDACTED]	— 1.055		
A	— 1.018		<input checked="" type="checkbox"/>
T	— 1.055		
[REDACTED]	1.074		
A	— 1.018		<input checked="" type="checkbox"/>
T	1.074		
[REDACTED]	— 1.093		

Chain operations

$$\frac{15.4 \times 7.23}{12.6} = 8.836$$

Decimal point in 3rd position

	15.4	<input checked="" type="checkbox"/>
	7.23	<input checked="" type="checkbox"/>
	12.6	
[REDACTED]	8.836	

If it is required to read the intermediate results, operate as follows:

	15.4	<input checked="" type="checkbox"/>
	7.23	
[REDACTED]	111.342	<input checked="" type="checkbox"/>
	12.6	
[REDACTED]	8.836	

Accumulation in the auxiliary register

a) $1.3 \times 4.52 = 5.876$
 $-0.15 \times 2.25 = -0.338$

 5.538

Decimal point in 3rd position

	1.3		X
	4.52		
<input checked="" type="radio"/>	5.876		
	.15	-	X
	2.25		
<input checked="" type="radio"/>	-0.338		
M	5.538		

b) $12.56 \times 2.5 \times 35.2 = 1105.280$
 $2.56 \times (-3.8) \times 4.5 = -43.776$

 1061.504

Decimal point in 3rd position

	12.56		X
	2.5		X
	35.2		
<input checked="" type="radio"/>	1105.280		
	2.56		X
	3.8	-	X
	4.5		
<input checked="" type="radio"/>	-43.776		
M	1061.504		

c) $\frac{1}{3} + \frac{1}{5} + \frac{1}{7} = 0.67618$

Decimal point in 5th position

- | | | |
|----------------------------------|---------|-----------------------|
| | 1 | <input type="radio"/> |
| | 3 | |
| <input type="radio"/> | 0.33333 | |
| | 1 | <input type="radio"/> |
| | 5 | |
| <input type="radio"/> | 0.20000 | |
| | 1 | <input type="radio"/> |
| | 7 | |
| <input type="radio"/> | 0.14285 | |
| <input checked="" type="radio"/> | 0.67618 | |

Constant Factor Operations

a) $12.473 \times 11.6 = 144.687$
 $8.2 \times 11.6 = 95.120$

Decimal point in 3rd position

- | | | |
|----------------------------------|---------|----------------------------------|
| | 11.6 | <input type="radio"/> |
| | 12.473 | <input checked="" type="radio"/> |
| <input checked="" type="radio"/> | 11.600 | |
| <input type="radio"/> | 144.687 | |
| | 8.2 | <input checked="" type="radio"/> |
| <input checked="" type="radio"/> | 11.600 | |
| <input type="radio"/> | 95.120 | |

or

- | | | |
|----------------------------------|---------|----------------------------------|
| | 11.6 | <input checked="" type="radio"/> |
| | 12.473 | |
| <input type="radio"/> | 144.687 | |
| <input checked="" type="radio"/> | 11.600 | <input checked="" type="radio"/> |
| | 8.2 | |
| <input type="radio"/> | 95.120 | |

b) $1483,6 : 6.2 = 239.290$
 $1.2 : 6.2 = 0.193$

Decimal point in 3rd position

6.2	○
1483.6	:
M 6.200	
239.290	
1.2	:
M 6.200	
0.193	

Inverse value calculations

When the value, whose inverse is desired to be calculated, is a result of previous calculations, this process avoids the use of the auxiliary register.

$$\frac{a}{a + b}$$

$$\frac{3.27}{3.27 + 4.15} = 0.440$$

Decimal point in 3rd position

3.27	█
4.15	█
█ 7.420	
3.27	:
T 7.420	
█ 0.440	

or

4.15	█
3.27	█
A 3.270	:
T 7.420	
█ 0.440	

Examples of applications

Percentage Analysis

41.15	27.57 %
30.90	20.71 %
72.11	48.32 %
<u>5.07</u>	<u>3.40 %</u>
149.23	100.00 %

Decimal point in 4th position

	41.15	<input type="checkbox"/>
	30.9	<input type="checkbox"/>
	72.11	<input type="checkbox"/>
	5.07	<input type="checkbox"/>
	100	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> T	149.2300	
<input type="checkbox"/>	0.6701	<input checked="" type="checkbox"/> X
	41.15	
<input type="checkbox"/>	27.5746	
<input checked="" type="checkbox"/> A	0.6701	<input checked="" type="checkbox"/> X
	30.9	
<input type="checkbox"/>	20.7061	
<input checked="" type="checkbox"/> A	0.6701	<input checked="" type="checkbox"/> X
	72.11	
<input type="checkbox"/>	48.3209	
<input checked="" type="checkbox"/> A	0.6701	<input checked="" type="checkbox"/> X
	5.07	
<input type="checkbox"/>	3.3974	
<input checked="" type="checkbox"/> M	99.9990	

Calculation of depreciation

One machine costs £ 1,200. What is its value after three years, assuming an annual depreciation of 15%.

$$V = (1 - 0.15)^3 \times 1,200 = 736.95$$

Decimal point in 6th position.

- | | | | |
|--------------------------|----------|-------------------------------------|-----------------------|
| | 1. | <input type="radio"/> | |
| | 0.15 | <input type="checkbox"/> | <input type="radio"/> |
| <input type="checkbox"/> | 0.850000 | <input checked="" type="checkbox"/> | |
| <input type="checkbox"/> | 0.850000 | <input checked="" type="checkbox"/> | |
| <input type="checkbox"/> | 0.850000 | | |
| <input type="checkbox"/> | 0.614125 | <input checked="" type="checkbox"/> | |
| | 1,200. | | |
| <input type="checkbox"/> | 736.9500 | | |

Calculation of raising percentage

Calculate the percentage increase between the values:

$$x_1 = 12,563 \quad \text{and} \quad x_2 = 15,500$$

$$\frac{15,500 - 12,563}{12,563} \times 100 = 23,37 \%$$

Decimal point in 2nd position

- | | | | |
|--------------------------|-----------|-------------------------------------|--------------------------|
| | 15,500 | <input type="checkbox"/> | |
| | 12,563 | <input type="radio"/> | |
| <input type="checkbox"/> | 12,563.00 | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | 2,937.00 | <input checked="" type="checkbox"/> | |
| | 100 | <input type="checkbox"/> | |
| <input type="checkbox"/> | 12,563.00 | | |
| <input type="checkbox"/> | 23.37 | | |

Interest calculation

interest on £ 15,000. for 120 days at 6.5 % per year

$$I = \frac{15,000 \times 120 \times 0.065}{360} = 325$$

Decimal point in 3rd position

15,000	X
120	X
.065	:
360	
325.000	

Interest calculation on bank account

Credit on 31st December	360 days	£ 2,869
May 29 Deposit	211 days	£ 1,850
June 17 Deposit	193 days	£ 680
August 21 Deposit	129 days	£ 700
September 19 Drawn	101 days	£ 1,200 —
October 14 Deposit	76 days	£ 2,200
		<hr/>
		£ 7,099
Interest on 31st December (3.25%)		£ 152.635
Credit on 31st December		£ 7,251.635

$$I = \frac{3.25 \times \Sigma (\text{days} \times \text{Capital})}{100 \times 360} = \frac{3.25 \times 1,690,730}{100 \times 360} = 152.635$$

Decimal point in 3rd position

360	X
2,869	
1,032,840.000	
211	X
1,850	
390,350.000	
193	X
680	
131,240.000	
129	X
700	

<input type="radio"/>	90,300.000		
	101	<input checked="" type="checkbox"/>	
	1,200	<input type="checkbox"/>	
<input type="radio"/>	— 121,200.000		
	76	<input checked="" type="checkbox"/>	
	2,200		
<input type="radio"/>	167,200.000		
<input checked="" type="checkbox"/>	1,690,730.000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	3.25	<input checked="" type="checkbox"/>	
	100	<input checked="" type="checkbox"/>	
	360		
<input type="radio"/>	152.635		
	2,869	<input type="checkbox"/>	
	1,850	<input type="checkbox"/>	
	680	<input type="checkbox"/>	
	700	<input type="checkbox"/>	
	1,200	<input type="checkbox"/>	<input type="checkbox"/>
	2,200	<input type="checkbox"/>	
<input type="checkbox"/>	7,099.000	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	152.635	<input type="checkbox"/>	
<input type="checkbox"/>	7,251.635		

Amortization rates

Property is purchased for \$ 128,500.

\$ 62,000 are paid in cash.

The remainder of the sum must be paid in six annual instalments at a yearly interest rate of 7.5 %.

Calculate the amount of the single instalments.

$$R = (128,500 - 62,000) \frac{0.075}{1 - (1 + 0.075)^{-6}} = 14,167.426$$

Decimal point in 6th position

	1	<input type="radio"/>
	.075	<input type="radio"/>
<input checked="" type="checkbox"/>	1.075000	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	1.075000	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	1.075000	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	1.075000	<input checked="" type="checkbox"/>

M	1.075000	X	
M	1.075000		
[REDACTED]	1.543301		
	1	:	
T	1.543301		
[REDACTED]	0.647961	=	[REDACTED]
	1	[REDACTED]	
	.075	:	CM
T	0.352039		
○	0.213044		
	128,500	[REDACTED]	
	62,000	=	[REDACTED]
[REDACTED]	66,500.000000	X	
M	0.213044		
[REDACTED]	14,167.426000		

Loan repayment

Capital for amortization	\$ 5,000.00
Repayment rate	5% per annum
Interest rate	8% per annum
Yearly quota:	5% on 5,000.00 = \$ 250.00
	8% on 5,000.00 = \$ 400.00
	<u> </u>
	\$ 650.00

Year	Interest	Repayment	Residual principal
1	400.00	250.00	4,750.00
2	380.00	270.00	4,480.00
3	358.40	291.60	4,188.40

and so on until the residual principal reaches zero.

Decimal point in 2nd position

	5,000	X
	.05	
○	250.00	
A	5,000.00	X
	.08	

<input type="radio"/>	400.00		
<input checked="" type="checkbox"/>	650.00		
<input checked="" type="checkbox"/>	5,000.00		
	250	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	4,750.00	<input checked="" type="checkbox"/>	
	.08		
	380.00	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	650.00		
	270.00	<input type="checkbox"/>	
	4,750		
	4,480.00	<input checked="" type="checkbox"/>	
	.08		
	358.40	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	650.00		
	291.60	<input type="checkbox"/>	
	4,480		
	4,188.40		
	and so on.		

Invoicing

	16 x 2,141 =	34,256.0000
	24 x 311 =	7,464.0000
		<hr/>
		41,720.0000
15 % discount		<hr/>
		6,258.0000
		<hr/>
		35,462.0000
4 % sales tax		<hr/>
		1,418.4800
		<hr/>
		36,880.4800
3 % discount		<hr/>
		1,106.4140
		<hr/>
Total		35,774.0660

Decimal point in 4th position

16	<input checked="" type="checkbox"/>
2,141	
<input type="radio"/> 34,256.0000	
24	<input checked="" type="checkbox"/>
311	
<input type="radio"/> 7,464.0000	

<input checked="" type="radio"/> M	41,720.0000	<input checked="" type="checkbox"/> X
	.15	<input type="checkbox"/>
<input type="radio"/>	-6,258.0000	
<input checked="" type="radio"/> M	35,462.0000	<input checked="" type="checkbox"/> X
	.04	
<input type="radio"/>	1,418.4800	
<input checked="" type="radio"/> M	36,880.4800	<input checked="" type="checkbox"/> X
	.03	<input type="checkbox"/>
<input type="radio"/>	1,106.4144	
<input checked="" type="radio"/> M	35,774.0656	

Evaluation of a polynomial

$$x^4 + 7.1x^3 + 6.72x^2 + 4x - 16 = -131.5668$$

for $x = -4.3$

Decimal point in 4th position

	4.3	<input type="checkbox"/>	<input checked="" type="checkbox"/> X
<input checked="" type="radio"/> A	- 4.3000		
<input type="radio"/>	18.4900		
<input checked="" type="radio"/> A	- 4.3000		<input checked="" type="checkbox"/> X
<input checked="" type="radio"/> T	18.4900		
<input type="radio"/>	- 79.5070		
<input checked="" type="radio"/> A	- 4.3000		<input checked="" type="checkbox"/> X
<input checked="" type="radio"/> T	- 79.5070		
<input type="radio"/>	341.8801		
<input checked="" type="radio"/> A	- 4.3000		<input checked="" type="checkbox"/> X
<input checked="" type="radio"/> A	- 4.3000		
<input type="radio"/>	18.4900		
<input checked="" type="radio"/> A	- 4.3000		<input checked="" type="checkbox"/> X
<input checked="" type="radio"/> T	18.4900		
<input type="radio"/>	- 79.5070		<input checked="" type="checkbox"/> X
	7.1		
<input type="radio"/>	- 564.4997		
	4.3	<input type="checkbox"/>	<input checked="" type="checkbox"/> X
<input checked="" type="radio"/> A	- 4.3000		
<input type="radio"/>	18.4900		<input checked="" type="checkbox"/> X
	6.72		

<input type="radio"/>	124.2528		
	4.3	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	4		
<input type="radio"/>	— 17.2000		
	16	<input type="checkbox"/>	<input type="radio"/>
<input checked="" type="checkbox"/>	— 131.5668		

or

	4.3	<input type="checkbox"/>	<input type="radio"/>
<input checked="" type="checkbox"/>	— 4.3000		<input type="checkbox"/>
	7.1		<input type="checkbox"/>
<input type="checkbox"/>	2.8000	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	— 4.3000		
<input type="checkbox"/>	— 12.0400		<input type="checkbox"/>
	6.72		<input type="checkbox"/>
<input type="checkbox"/>	— 5.3200	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	— 4.3000		
<input type="checkbox"/>	22.8760		<input type="checkbox"/>
	4		<input type="checkbox"/>
<input type="checkbox"/>	26.8760	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	— 4.3000		
<input type="checkbox"/>	— 115.5668		<input type="checkbox"/>
	16	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	— 131.5668		

IME26

schemi di calcolo
 calculation schedule
 schémas de calculs
 esquemas de calculo
 rechnungsbeispiele

$25.22 + 32.57 - 11.6 = 46.19$	$25 \square 22 \blacksquare \quad 32 \square 57 \blacksquare \quad 11 \square 6 \blacksquare$ $\blacksquare \quad \blacksquare$	0000046,1900
$42.5 \times 5.7 = 242.25$	$42 \square 5 \times 5 \square 7 \blacksquare$	000002422500
$-52.32 \times 1.537 = 80.4158$	$52 \square 32 \blacksquare \times 1 \square 537 \blacksquare$	-000000804158
$26.68 : 2.56 = 10.4218$	$26 \square 68 \blacksquare : 2 \square 56 \blacksquare$	000000104218
$2.21^2 = 4.8841$	$2 \square 21 \times A \blacksquare$	000000048841
$(-3.2)^3 = -32.768$	$3 \square 2 \blacksquare \times A \blacksquare \quad A \times T \blacksquare$	-000000327680
$(5.31 \times 3.75) : 17 = 1.1713$	$5 \square 31 \times 3 \square 75 \blacksquare : 17 \blacksquare$	00000001,1713
$8.32 \times 2.25 \quad \times 32.75 = 613.0800$ $5.27 \times (-4.31) \times 57.23 = -1299.9051$ -686.8251	$8 \square 32 \times 2 \square 25 \times 32 \square 75 \bigcirc$ $5 \square 27 \times 4 \square 31 \blacksquare \times 57 \square 23 \bigcirc$ M	00000613,0800 -00001299,9051 -00000686,8251

$$\begin{array}{r}
 17.23 : 4.3 = 4.0069 \\
 - 5.25 : 3.27 = -1.6055 \\
 \hline
 2.4014
 \end{array}$$

17 23 4 3

5 25 3 27

M

0000004,0069

-0000001,6055

0000002,4014

$$\begin{array}{r}
 12.47 \times 5.6 = 69.8320 \\
 8.23 \times 5.6 = 46.0880
 \end{array}$$

5 6 12 47

A **X** 8 23

00000069,8320

00000046,0880

$$\begin{array}{r}
 523.756 : 26.57 = 17.7123 \\
 327.245 : 26.57 = 12.3163
 \end{array}$$

26 57 523 756 **M**

327 245 **M**

00000019,7123

00000012,3163

$$\frac{3.27}{3.27 + 4.15} = 0.4407$$

4 15 3 27 **A** **T**

00000000,4407

$$\begin{array}{r}
 572 \times 53.25 = 30459.0000 \\
 75 \times 105.75 = 7931.2500 \\
 \hline
 38390.2500
 \end{array}$$

572 53 25

75 105 75

M

00030459,0000

00007931,2500

00038390,2500

$$\begin{array}{r}
 - 15\% \\
 - 5758.5375 \\
 \hline
 32631.7125
 \end{array}$$

15

M

-00005758,5375

00032631,7125

$$\begin{array}{r}
 + 4\% \\
 1305.2685 \\
 \hline
 33936.9810
 \end{array}$$

04

M

00001305,2685

00033936,9810

