CASIO®

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OPERATION MANUAL
MANUAL DE OPERACION

CASIO ALARM COMPUTER
(AQ-810)

Dear Customer,

Congratulations on your purchase of this unique electronic alarm-calculator.

In addition to full calculating conveniences, this product has two kinds of alarm-timers and alarm-clock functions.

This manual will familiarize you with the diverse ways this highly capable unit can serve you.

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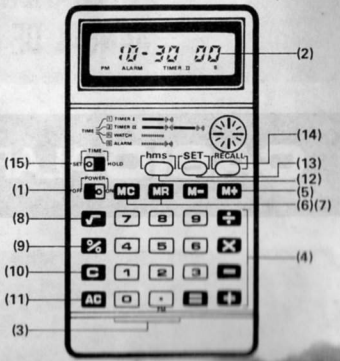
1 NOMENCLATURE



(1) Power switch:
Move the switch to the "ON" position to start operations.

(2) Read-out:
Shows each entry and result in all calculations, suppressing unnecessary 0's (zeroes).
Shows the time being measured by alarm-timer.
Shows hour, minute, second, AM/PM in alarm-clock.

(3) Numeral/Decimal point key:
Enters numerals. For decimal places use the ⊡ key in logical sequence. The ⊡ key also operates the "PM" sign for time setting.

(4) Function command & Equal keys:
Press the numeral and function command keys (in the same logical sequence as the formula) and the ⊟ key obtains the answer.
A function command is automatically corrected by pressing the desired key.

(5) Memory plus (minus) key:
Transfers a displayed number to the memory positively (negatively). Obtains answer in four functions and automatically accumulates it into the memory positively (negatively).

(6) Memory recall key:
Recalls the contents of the memory without clearing.

(7) Memory clear key:
Clears contents of the memory.

(8) Square root key:
Extracts the square root of a displayed number.

(9) Percent key:
Performs percentage calculations, including add-on/discounts and mark-ups.

(10) Clear key:
Clears entry for correction.

(11) All clear key:
Clears all calculating registers except the memory, and also releases overflow check.

(12) Time entry key:
Performs time calculations.
Enters time for setting alarm-timer or alarm-clock.

(13) Time set key:
Sets the alarm-timer or alarm-clock.

(14) Time recall key:
Retrieves the time being measured by alarm-timer.
Retrieves the time preset for alarm.

(15) Display holding switch:
SET: Calculations are performed.
Alarm-timer or alarm-clock is set.
HOLD: The time display for the alarm-timer or alarm-clock is held and other operations can not be made.

2 POWER SOURCE

* Two silver oxide batteries (Type: G-13, S 76E, MS-76H, or RS-76G).
* G-13 type batteries provide approximately 3,000 hours of continuous operation.
* The battery indicator sign "B" appears in the lower right-hand corner of the read-out when you switch on power, and continues to appear to indicate that power is ON.
* When the sign "B" does not appear or disappears during operation, batteries should be changed immediately since insufficient power adversely affects the unit.

* Slide open the battery box cover on the back of the unit and insert two new batteries with the plus terminal (flat side) on top.
Be sure to switch off power before changing.

3 CARE OF YOUR UNIT

* Since the unit contains precise electronic components, never attempt to disassemble it.
* Be careful not to knock or drop the unit.
Avoid operating the keys roughly.
* Avoid using the unit in extreme temperatures below 0°C (32°F), or above 40°C (104°F).
* Avoid using the unit in extremely dusty or humid conditions.
* Special care should be taken not to leave dead batteries inside the unit.
* Remove batteries when not using the unit for an extended period.

4 USAGE

This unit has an alarm-clock, two kinds of alarm-timer functions and calculating capability.
The following shows 3 combinations of functions. Choose one combination depending on your particular needs.

Combination 1: Calculating — clock — Alarm
Combination 2: Calculating — Alarm timer I
Combination 3: Calculating — Alarm timer II

4-1 Operations of each combination and read-out example.

* Battery indicator sign "B" is omitted in the following read-out examples.

■ Combination 1

	OPERATION	READ-OUT
(To perform calculations)	* AC	** 0. ALARM
		(You can start calculating immediately.)
(To retrieve preset time for alarm)	AC (RECALL)	** 5-30 00 PM ALARM
		PM (Lit.) AM (Not lit.) — Hour, Alarm sign, Minute, Second
*** (To display present time)	AC (hms)	** 10-58 24 PM ALARM
		PM (Lit.) AM (Not lit.) — Hour, Minute, Second

* Calculations can be made without pressing AC when the preset time for alarm has been retrieved.

** The alarm sign does not appear when the alarm is not preset.

*** When the display holding switch is set at the "HOLD" position, it gives constant time display and no other operation can be made.

■ Combination 2 and 3

	OPERATION	READ-OUT
(To perform calculations)	AC	* 0. TIMER I
		(You can start calculating immediately.)
(To retrieve the time being measured by alarm-timer)	(RECALL)	* * 1-18 37 TIMER I
		Hour, Minute, Timer sign, Second

* The timer sign does not appear when the alarm-timer is not preset.

** When the alarm-timer II is set (in combination 3), the timer sign "TIMER II" appears instead of "TIMER I" in the same position.

*** When the display holding switch is set at "HOLD" position, the display shows constant time being measured and no other operation can be made.

4-2 How to set clock and alarm (In combination 1)

EXAMPLE		OPERATION	READ-OUT
Setting the clock to 2:53 PM.		* It is advisable to set a time one or two minutes ahead of a time signal to be prepared for accurate time setting.	
	"SET"	AC	0.
(Entry of hour)	2	(hms)	2–
(Entry of minute)	53	(hms)	2-53
(PM sign)		•	PM 2-53
		(SET)	PM 2-53

[For entry of 2:00, for example, press 2 (hms) in sequence.]

[The "PM" sign indicates PM. When using a 24-hour system [14 (hms) = 2:00 PM and 2 (hms) = 2.00 AM] or entering AM, pressing the PM sign • is not necessary.]

EXAMPLE	OPERATION	READ-OUT
	With this operation, you are ready for time setting. Now press (hms) on the time signal from a radio, telephone or other correct time indicator.	
	(hms)	PM 2-53 00 [The moment the (hms) key is pressed, the clock starts.]

Setting the alarm at 7:30 PM.

* Remember: The alarm can not be set unless the clock setting has been performed.
* Once the alarm is set, the electronic buzzer sounds for 10 seconds at preset time until it is cleared.

"SET"	AC	0.
(Entry of hour and minute)	7 (hms) 30 (hms)	7-30
	•	7-30 PM ➡ Note: AM settings do not require this step.
	(SET) ◻	7-30 00 PM ALARM ➡ [The "ALARM" sign appears indicating alarm setting.]

With this operation, the alarm set is complete and the buzzer sounds at 7:30 PM everyday.

* Alarm can be set at 1 minute units.
* To stop the buzzer while sounding, press the (RECALL) key.

Note:

1) Time can also be set by the 24-hour system by following the above example.
   It is necessary, however, to enter the PM sign for the time range, 12:00 PM to 12:59 PM.
2) To clear the alarm, operate AC (SET) ◻ in sequence.
3) Both the clock and alarm are cleared simultaneously by the operation, AC (SET) (hms).

4-3 How to set the alarm-timer (In combination 2 or 3)

* Once the Timer I is set, countdown starts and the electronic buzzer sounds for 10 seconds at the predetermined setting.
* Once the Timer II is set, countdown starts and the electronic buzzer sounds for 10 seconds every time at the predetermined setting until cleared.
* Both Timer I and Timer II can be set to 23 hours 59 minutes at 1 minute units.
* To stop the buzzer while sounding, press the (RECALL) key.

EXAMPLE	OPERATION	READ-OUT
Setting Timer I at 30 minute periods	"SET" AC	0.
(Entry of time)	◻ (hms) 30 (hms)	0-30
(Start)	(SET) 1	0-30 00 TIMER I ➡ [Timer sign "TIMER I" appears indicating that Timer I is set.]
	⋮	⋮
(Electronic buzzer sounds for 10 seconds.)		0-00 00 TIMER I
(Timer I is automatically cleared and timer sign disappears.)		0-00 00

* To clear Timer I, operate AC (SET) 1 in sequence.

EXAMPLE	OPERATION	READ-OUT
Setting Timer II for a 3-hour period		
	"SET" AC	0.
(Entry of time)	3 (hms)	3–
(Start)	(SET) ■ 2	3–00 00 TIMER II
		⋮
(Electronic buzzer sounds for 10 seconds and countdown continues for another 3-hour period.)		0–00 00 TIMER II
		2–59 59 TIMER II
		⋮

(The appearance of the "TIMER II" sign indicates that Timer II is set.)

* To clear Timer II, operate AC (SET) ■ in sequence.

Note: New settings automatically clear prior ones in all combinations. All set factors are cleared by turning OFF the power switch.

4-4 Calculation examples

* Set the display holding switch to the "SET" position and press the AC key prior to starting calculations.
* Calculations do not affect the factors set in the clock, alarm or timer.
* Overflow is indicated by the "E." sign and stops further calculation.
To release the locked registers caused by the overflow check, press the AC key.

Overflow occurs:

(1) When the integer part of an answer, whether intermediate or final, exceeds 8 digits (7 digits for negatives).
(2) When the integer part of an accumulated total in the memory exceeds 8 digits (7 digits for negatives).

In the case of (1), however, the significant digits of the answer are displayed and the decimal point indicates that the true decimal position is 8 digits to the right.

EXAMPLE	OPERATION	READ-OUT
1234567 x 10000 = 12345670000	1234567 ×	1234567.
	10000 =	123.4567E
	Answer reads:	12345670000

■ **Basic calculations**

741 – 258 + 963 = 1446	741 − 258 + 963 =	1446.
45.6 x 78 ÷ 12 = 296.4	45 · 6 × 78 ÷ 12 =	296.4
(12 + 3 – 45.6) x 9876 ÷ 5 = –60441.12	12 + 3 − 45 · 6 × 9876 ÷ 5 =	–60441.12
(–36) x 7 = –252	AC − 36 × 7 =	–252.

■ Constant calculations

EXAMPLE	OPERATION	READ-OUT
23 x 3.3 = 75.9	3 [·] 3 [×] [×] 23 [=]	75.9
116 x 3.3 = 382.5	116 [=]	382.8
963 ÷ 12 = 80.25	12 [+] [+] 963 [=]	80.25
2580 ÷ 12 = 215	2580 [=]	215.

* For addition/subtraction, the first entry is set as a constant in the same way as the above operation.
* The constant is released by performing a normal calculation.
* Powers and reciprocals can be obtained by the use of constant function.

$1.5^2 = 2.25$	1 [·] 5 [×] [×] [=]	2.25
$1.5^3 = 3.375$	[=]	3.375
$1.5^4 = 5.0625$	[=]	5.0625
$\frac{1}{4} = 0.25$	4 [+] [+] 1 [=]	0.25
$\frac{1}{4^2} = 0.0625$	[=]	0.0625
$\frac{26}{12+45} = 0.4561403$	12 [+] 45 [+] [+] 26 [=]	0.4561403

■ Memory calculations

[MC] ENTRY [+] ([−] , [×] , [÷]) ENTRY [M+] ([M−]) ····· Obtains an answer and automatically accumulates it into the memory positively (negatively).

ENTRY [+] ([−] , [×] , [÷]) ENTRY [M+] ([M−]) ····· Obtains an answer and automatically accumulates it into the memory positively (negatively).

[MR] ····· Recalls the accumulated total in the memory without clearing.

→ Clears contents of the memory.

* Memory sign "M" appears in the upper left-hand corner of the read-out to indicate that a number is stored in the memory.
* Be sure to press the [MC] key prior to starting a memory calculation.

EXAMPLE	OPERATION	READ-OUT
70 + 40 + 100 = 210	[MC] 70 [+] 40 [+] 100 [M+]	M 210.
− 80 − 5 + 20 = 95	80 [−] 5 [+] 20 [M+]	M 95.
115	[MR]	M 115.
53 x 21 = 1113	[MC] 53 [×] 21 [M+]	M 1113.
+ 46 x 37 = 1702	46 [×] 37 [M+]	M 1702.
2815	[MR]	M 2815.
456 ÷ 1.2 = 380	[MC] 1 [·] 2 [+] [+] 456 [M+]	M 380.
+ 4578 ÷ 1.2 = 3815	4578 [M+]	M 3815.
4195	[MR]	M 4195.

EXAMPLE	OPERATION	READ-OUT
$\frac{85+26}{43-18} = 4.44$	MC 43 − 18 M+	M 25.
	85 + 26 + MR =	M 4.44

* The M+ (M−) key also works to transfer displayed entries or results to the memory positively (negatively) as many times as the M+ or M− key is pressed.

$7+7-7+(2\times3)+(2\times3) = 19$	MC 7 M+ M+ M+ 2 × 3 M+ M+ MR	M 19.

■ **Square root**

* The minus sign (−) appears when a negative figure is extracted.

$\sqrt{3} = 1.7320508$	3 √	1.7320508
$\sqrt{7+2\sqrt{5}} = 3.387054$	5 √	2.2360679
	× 2 + 7 =	11.472135
	√	3.387054

■ **Percentage calculations**

12% of 1500 ····· 180	1500 × 12 %	180.
Percentage of 660 against 880 ····· 75%	660 + 880 %	75.

* The constant capability is utilized in these percentage calculations.

15% add-on of 2500	2500 × 15 % +	2875.
25% discount of 3500	3500 × 25 % −	2625.

Mark-up (To fix the selling price)

EXAMPLE	OPERATION	READ-OUT
What will the selling price and profit be when the purchasing price of an item is $480 and the profit rate to the selling price is 25%?	480 + 25 %	640. (Selling price)
	(Subsequently) −	160. (Profit)

■ **Time calculations**

Read-out example: 63−52 41 Equals 63 hours 52 minutes 41 seconds

* The range for sexagesimal notation is from minus 9 hours 59 minutes 59 seconds to 99 hours 59 minutes 59 seconds. When an answer, whether intermediate or final, is outside the above range, it converts to decimal notation.

* Pressing hms key after = converts the answer obtained as a sexagesimal to the decimal notation. Decimal notations can be re-converted to sexagesimals by the hms key.

* When hour is 0, entry of 0 is necessary.

* The constant capability can be used in time calculations.

1 hour 20 minutes 30 seconds + 8 hours 8 minutes 10 seconds 9 hours 28 minutes 40 seconds	1 hms 20 hms 30 + 8 hms 8 hms 10 = hms	1−20 30 9−28 40 9.47777
1 hour 0 minute 32 seconds − 45 minutes 15 minutes 32 seconds	1 hms hms 32 − 0 hms 45 =	1−00 32 0−15 32
5 hours 30 minutes × 300 = 1650	5 hms 30 × 300 =	1650.

5 SPECIFICATIONS

- **Calculator**

Abilities: 4 basic functions, constant calculations for 4 functions, square/powers, automatic accumulation in 4 functions, direct access to the memory, square root, percentage calculations, time calculations and mixed calculations.

Capacity: Entry/Four basic functions · · · · · 8 digits
Square root · · · · · 8 digits
Time calculations · · · · · 99 hours 59 minutes 59 seconds—minus 9 hours 59 minutes 59 seconds

Read-out: Suppresses unnecessary 0's (zeroes)

Decimal point: Full floating mode with underflow

Overflow check: Indicated by an "E." sign, locking the calculator

Negative number: Indicated by a floating minus sign.

- **Timepiece (Clock, alarm and timers)**

Crystal oscillator frequency: 32,768 Hz

Accuracy: Within ± 3 sec. per day (Normal temp.)

Read-out: 12-hour system digital display of hour, minute, second, AM/PM (Clock and alarm), and sign (ALARM, TIMER I or TIMER II)

Time setting: Direct setting by key operation

Alarm: Electronic buzzer (Seconds for 10 seconds)

- **READ-OUT** Liquid crystal display
- **MAIN COMPONENT** One chip C-MOS-LSI, Crystal oscillator (tuning fork type)
- **POWER CONSUMPTION** 0.019 W

- **POWER SOURCE** Two silver oxide batteries (Type: G-13, S 76E, MS-76H or RS-76G)
The unit gives approximately 3000 hours continuous operation on Type G-13.
- **USABLE TEMPERATURE** 0°C – 40°C (32°F – 104°)
- **DIMENSIONS** 7mmH x 63mmW x 118mmD (1/4"H x 2-3/8"W x 4-5/8"D)
- **WEIGHT** 62 g (2oz) including batteries