CASIO

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CASIO
CQ-1 COMPUTERIZED QUARTZ
# OPERATION MANUAL
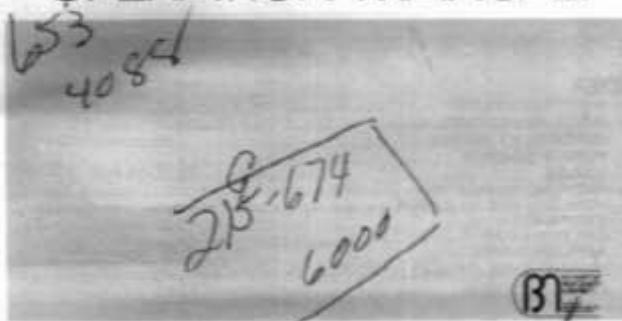
INTRODUCTION

Dear customer,

Congratulations on your purchase of this CASIO CQ-1 Computerized Quartz. This is a revolutionary new product designed to serve the following three purposes, a clock with four alarms, a stopwatch and a calculator. Please read this manual carefully and thoroughly so that a longer machine life can be ensured.

INDEX

1 NOMENCLATURE

(1) READ-OUT

Shows the date, day, hours, minutes and AM/PM in the clock mode, the time measured in the stopwatch mode and all figures including entries and answers in the calculator mode.

(2) MODE SELECTOR

Allows the use of the unit in the three different modes of clock, stopwatch and calculator. It is also used to switch on and off the display and to set the clock and alarm.

(3) ELECTRONIC BUZZER

Sounds at a preset time with a high-frequency electronic tone.

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(4) AC ADAPTOR SOCKET (JACK)
Used when connecting this unit to the AC outlet.

(5) KEYBOARD
Used to set the time, date and alarm time and also to perform calculations. It has numeral keys, ⊞ – ⊠, ⊡ and command keys. ⊟ ⊟ . . . . . ⊟ and ⊟.

(6) TIME KEY
Allows the clock to be started with a time signal.
When the clock is powered by battery, the key is used to display the time.
In the stopwatch mode, it also serves as a start/stop key.

(7) LAP KEY
Used to check the lap times of a race, etc. in the stopwatch mode.

(8) ALARM KEY
Used to set the alarm or stop the electronic buzzer.

2 MODE SELECTOR

The mode selector allows the setting of the unit to a desired mode so it can perform different functions.
● With the mode selector in ST, the unit can serve as a stopwatch.
● When the unit is not in use, place the mode selector in OFF. In this case, the time display disappears but the clock keeps timing.

● Setting the mode selector in TIME permits use of the unit as a clock.
When the unit is battery-powered, the time can be displayed by depressing the ⊟ key, and the time display continues only while the key is kept depressed.
When the unit is connected to the AC adaptor, it gives constant time display.
● When the mode selector is set in COMP, the unit can be used as a calculator.
● When the mode selector is placed in SET, the setting of the date, time and alarm time is possible.

Since the clock is operated by two silver oxide batteries (G-13), it continues timing regardless of the mode selector position.

* EACH TIME THE MODE SELECTOR IS OPERATED, BE SURE TO DEPRESS THE ⊟ KEY.

3 IMPORTANT NOTES

● Since the CQ-1 contains precision electronic components, never attempt to disassemble it.
Be careful not to drop or give the unit a hard shock. Avoid operating the keys roughly.
● Avoid using the CQ-1 in an extremely dusty, hot or humid place. Never expose it to direct heat from a heater or to the direct sunshine for long periods, for instance, inside a car or on a terrace.
● To clean the exterior of the unit, use a dry, soft cloth or a cloth moistened with a neutral detergent. (The cloth should be squeezed hard after being dipped in the detergent.) Avoid using a lacquer thinner, benzine or alcohol.

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- When the unit is not used for a long period or when it is operated by AC power, it is advisable to remove the AA-size dry battery.
- Do not remove the silver oxide batteries unless it is exhausted.

4 POWER SOURCE

The CO-1 is operated by two different types of batteries for the clock and display.

For clock . . . . Two silver oxide batteries (G-13) (The batteries supply power for alarm, stopwatch and calculator functions.)

For display . . . One AA-size dry battery (UM-3, SUM-3 or AM-3), or AC power (The AA-size battery supplies power for display of time, calendar, entry, calculation result, etc.)

LOADING BATTERIES

1. Lightly press the portion marked OPEN on the battery box cover on the back of the unit with your finger, and push it in the direction of the arrow. Now the cover can be opened.
2. When it is opened, another small cover can be seen inside. It can be opened in a similar manner.
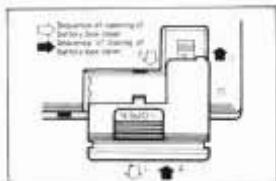
3. Put two silver oxide batteries (for the clock) into the smaller box, and replace the cover.
4. Put the AA-size dry battery (for display) into the larger box and replace the cover.
* Take care not to reverse battery polarity.
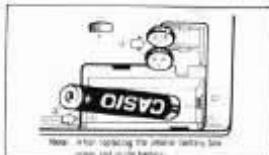
BATTERY LIFE AND REPLACEMENT INTERVALS
- The two silver oxide batteries (for the clock) continue to operate for about one year.
- The AA-size dry battery (UM-3 for display) operates continuously for about 10 hours.
- When the battery voltage for display drops, the display begins to flash or grows dim.
- When the battery voltage for the clock drops, all functions will be stopped.
- If any sign of voltage drop is noticed, replace the batteries immediately.

OPERATION WITH AC POWER
AC connection automatically cuts off the battery, and the power source switches to AC power. (In this case, the battery for display may be removed.)
If the AC adaptor is used for a prolonged period, it will become slightly hot, but no adverse effect will be given to machine life or performance.

* When connecting to the AC adaptor, be sure to place the mode selector in OFF.

CAUTION

- If the unit is not used for a long period, it is advisable to remove the AA-size battery. Otherwise, the battery may leak, thus damaging component parts.
- Do not remove the silver oxide batteries unless it is exhausted.
- Don't leave a dead battery in the battery box.
- If the electronic buzzer does not stop sounding or the stopwatch does not operate normally when new silver oxide batteries are loaded, then remove the batteries and put them back in after waiting one minute or so.

5 USAGE

PLEASE STICK THE LABEL ENCLOSED TO THE BACK OF THE UNIT FOR YOUR REFERENCE.

DIGITAL CLOCK

- Set the mode selector to TIME.
- Put two silver oxide batteries (G-13) for the clock into the battery box. The clock continues to operate for about one year.
- If the clock is set correctly, it will keep good time without being affected by any other operation (e.g., display battery replacement).

READ OUT:

(June) 25th (Sat.) 10:58 PM is on display

1. Setting the time

As this clock maintains accuracy within ±15 seconds per month (under normal temperatures), it is advisable to lock the time display in anticipation of a time signal about one or two minutes ahead and wait. On hearing the time signal, depress the ≡ key, and the clock will start. Since the calendar is permanently programmed, no date adjustment is required each month or in a leap year, but the entry of the year and month is necessary for setting of the time.

Example: Setting to 10:58 PM. (Sat., June 25, 1977)

* Place the mode selector in SET.

		0.
(Entry of year)	[9][7][01]	7 7
(Entry of month)	[●][01]	7 7 6
(Entry of date)	[●][●][01]	7.7.-.0.6.-.2.5.

→ (Day is automatically set with entry of date. Dots appear up to SAT, indicating it is Saturday.)

(Entry of hours)	[1][0][TM]	2.5. .1.0. . .
(Entry of minutes)	[5][8][TM]	2.5. .1.0. .5.8.
(PM sign)	[+]	2.5. .1.0. .5.8.

→ * For entry of 10:00, depress [1][0] [TM][0][TM]

→ (Dot appears indicating PM. For entry of AM, no key operation is required.)

With this operation, you are ready for time setting. Now just depress the 🔔 key with the time signal.

Time signal of 58 min.   🔔 2.5. .1.0.-.5.8. → (The moment that 🔔 key is depressed, "−" symbol appears between hours and minutes, indicating that clock has started. When mode selector is in SET, dot indicating day will not flash.)

* To correct a wrong numerical entry or command, depress the [C] key and start the above key operation all over again. When an operation error is made, an "E" sign

appears, locking the unit. To release, repeat the same procedure.
* After setting the time, place the mode selector in a desired position. At any mode position, the clock keeps timing.

2. Adjusting the time
Once the time is set, the clock keeps good time, except when the batteries (G-13) are exhausted. If adjustment is necessary, follow the above key operation.

HOW TO USE ALARM
The alarm can be set in four alarm time positions (1, 2, 3 and 4) and at intervals of one minute or more. The command of AM and PM for each setting is possible. The electronic buzzer continues sounding for one minute at each preset alarm time.

1.Setting the alarm

1. Setting the alarm
* Place the mode selector in SET.
Example: Setting Alarm 1 to 6:30 PM

		0.
(Entry of hours)	[6][TM]	6
(Entry of minutes)	[3][0][TM]	6 30
(Entry of PM)	[+]	6 30.
(Entry of alarm No.I)	🔔[1]	1 6 − 30.

Next, set Alarm 2 to 9:00 AM and Alarm 3 to 3:05 PM. Alarm 4 is not used. Proceed as follows:

OPERATION	READ-OUT
⊡⊞O⊞≣⊞	2 9-00
⊡⊞⊡⊞⊞≣⊞	3 3-05
⊞≣⊞	4 0-00

With this key operation, the setting of the alarm is complete, and the alarm will sound at a preset time.
* The electronic buzzer gives out different tones for each alarm.

Alarm 1 — — — — — — — — — · · · · ·
Alarm 2 — — — — — — — — — · · · · ·
Alarm 3 — — — — — — — — · · · · ·
Alarm 4 — — — — — — — — — · · · · ·

● After setting the alarm, place the mode selector in a position other than SET.
● The alarm Nos can be set in any order.
● If an error is made in key operation, depress the ⊞ key and start the operation all over again.
● The clock will not be affected by alarm time setting.
● When powered by battery, the alarm time can be checked by placing the mode selector in TIME.
When the buzzer stops sounding, the display of alarm time disappears. (No time is displayed except when the mode selector is in TIME.)

2. Checking the alarm time

To check the alarm time, set the mode selector to COMP and proceed as follows:

KEY OPERATION	READ OUT
≣①	1 6-30
≣②	2 9-00
≣③	3 3-05
≣④	4 0-00

3. Changing or clearing the alarm time setting

Change . . . . . The alarm time can be changed by simply setting a new alarm time.
Clear . . . . . . Depress the ⊞ key, ≣ key, and numeral key (1, 2, 3 or 4), in that order.
Example: Clearing Alarm 2.

OPERATION	READ-OUT
⊞≣② ·	2 0-00

4. Stopping the buzzer

The electronic buzzer sounds at a preset time for one minute, regardless of the mode selector position.

To stop the buzzer, depress the ▦ key.
* If the mode selector is in OFF, the buzzer cannot be stopped by depressing the ▦ key. To stop the buzzer, change the mode selector position and depress ▦ key.

STOPWATCH

- Set the mode selector to ST.
- The stopwatch can measure time up to 9 hours 59 minutes 59 seconds and 9/10ths of a second. The moment that the time accumulated reaches 10 hours, the stopwatch reverts to "0" and restarts timing.

Read-out

9-59 59.9

Hour Min   Sec 1/10th of a second

The time is 9 hours 59 minutes 59 seconds 9/10ths of a second.

- In the stopwatch mode, the following three keys, ▦ (start/stop), ▦ (lap) and ▦ (reset), are used.

1. Normal time measurement

START	STOP	START	STOP	START	STOP
0	a	0	b	0	c
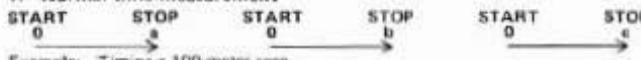
Example: Timing a 100-meter race

	Start → Goal		Check (recording of time)	
KEY OPERATION	▦	▦	0-00 13.8	▦
	(Reset) (Start)	(Stop)	(13.8 sec.)	(Reset)

2. Net time measurement (Excluding loss time)

START	STOP	START	STOP	START	STOP
0	a a	a b	b (a+b)	b c	c (a+b+c)

Example: Soccer game

	Start of game	Time-out (Timing is suspended)	Start of game	Half-time	Net time 45 min.	
KEY OPERA-TION	▦	▦	▦	▦	▦ 0-45 00.0	▦
	(Reset) (Start)	(Stop)	(Start)	(Stop)		(Reset)
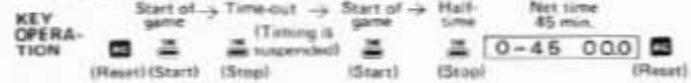
3. Lap time measurement

START	STOP		STOP		STOP

Example: Measuring lap times of a 1500-meter swimming race
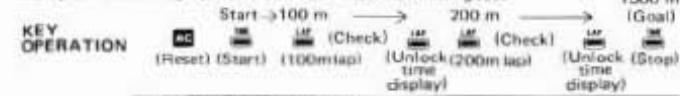
1500 m (Goal)

	Start →100 m	200 m	1500 m (Goal)			
KEY OPERATION	▦	▦	▦ (Check) ▦	▦ (Check)	▦	▦
	(Reset) (Start)	(100m lap)	(Unlock time display) (200m lap)	(Unlock time display)	(Stop)	

Check (recording of time)	
0-16 58.9	▦
(16 min. 58.9 sec.)	(Reset)

- It is advisable to replace the battery with a new one before timing an event continuously for a prolonged period. This will prevent the failure of the stopwatch function due to a battery voltage drop.

CALCULATOR

- Set the mode selector to COMP.
- By operating the keys, time and date calculations are possible in addition to the basic four functions and constant calculations. As the calendar is programmed from 1901 to 2099 inclusive, any day of the week can be found instantly and the number of days for a certain period of time can be calculated.
  Calculations are possible up to 8 digits and in the algebraic logic sequence.
- Overflow check
  If an error (e.g., a ÷ 0 =, time calculation of more than 99 hours, or date calculations beyond the programmed calendar range) occurs in calculations, or if an answer exceeds an 8-digit integer, an "E" sign appears in the first column, making further calculation impossible.
  The overflow check can be released by depressing the ▣ key.

EXAMPLE	OPERATION	READ-OUT
(12÷3−45.6) ×89÷7− =−389.0571	12▣3▣45▣6▣ 89▣7▣	−389.0571

EXAMPLE	OPERATION	READ-OUT
Constant calculations		
23×33=75.9	3▣3▣▣23▣	75.9
116×33=3828	116▣	3828
963÷12=80.25	12▣▣963▣	80.25
2580÷12=215	2580▣	215

* For the other two basic functions, the first entry is set as a constant in the same way as in the above operation.

Time calculations (Entry of 0 is necessary for 0)

	OPERATION	READ-OUT
1 hr. 25 min. +2 hr. 54 sec. 3 hr. 25 min. 54 sec.	1▣25▣0▣▣ 2▣0▣54▣▣	1−25 00 3−25 54
(2 hr. 18 min.) x 3 − 6 hr. 54 min.	2▣18▣0▣▣ 3▣	2−18 00 6−54 00

* No calculation can be done without re-entering the time displayed in the clock or stopwatch.

EXAMPLE	OPERATION	READ-OUT
Date calculations (1901 to 2099 inclusive)		
What will the day of the week be on Jan. 1, 1977?	77⊞1⊞1⊞	7.7.-0.1.-0.1 (Saturday) ←
What will the day of the week be on Dec. 31, 2001?	2001⊞12⊞31⊞	0.1. 12 31 → (Monday)
How many days are there from Feb. 1, to Mar. 31, 1977?	77⊞3⊞31⊞⊟ 77⊞2⊞1⊞⊟	7.7.-0.3-31 58.
What date and day of the week will the 100th day from Apr. 15, 1977 be?	77⊞4⊞15⊞⊞ 100⊟	7.7.-0.4.-.15 7.7.-07-24 → (Sunday)

- Constant calculations are possible for time and date calculations.
- To clear a wrong entry in calculations, depress the ▣ key, and make the right entry so you can continue further calculation. To correct a wrong entry in date or time calculations, depress the ▣ key and all the entry of date or time factors can be cleared.
Then restart with the year or hours.

6 APPLICATIONS   From Idea to Planned Use

1. To make effective use of the alarm with 4 settings

1) Set the alarm in four time positions at intervals of 2 or 3 minutes so you can use it as an alarm clock.

2) Set it at the time to leave for school, office and shopping, in that time sequence, so all your family will be on time.

3) Set it at the time to stop playing cards, start home work and go to bed, so you can instill good discipline in your children.

4) Set it at the time to give milk to your baby, take medicine and do other important thing so you won't need to watch the clock all the time.

5) Set it at the time for an appointment, important telephone call, meeting, etc. during office hours, so you are sure to be punctual for your appointment and in doing your office work.

2. What can you do with the calculator?

1) Checking of answers to arithmetical and mathematic problems, and calculations on household accounts and food calories.

2) Orienteering, rallies, and other events.

3) Calculations of bank interest using date calculation function.

3. Try using the stopwatch for sports or something else

1) Record your time in a race or in other sports.

2) Measure CM time length.
3) Measure the time required to solve mathematical problems.

7 IF ANY SIGN OF MALFUNCTION IS NOTICED

Should any sign of malfunction be noticed, consult the table below before taking the unit to a nearby dealer. If not remedied, the unit should be taken to the dealer for service.

TROUBLE	POSSIBLE CAUSE
NO DISPLAY APPEARS.	● Check battery connections.
DISPLAY FLASHES OR GROWS DIM.	● Check the charged state of battery.
DISPLAY DISAPPEARS SUDDENLY.	● Check AC adaptor connections.
DATE IS ONE DAY OFF.	● Check for wrong entry of AM/PM.
ALARM DOES NOT SOUND AT SET TIME.	● Check for wrong entry of AM/PM. ● Check if alarm is reset.
ALARM DOES NOT STOP WHEN ▦ KEY IS DEPRESSED.	● Check if mode selector is in OFF.

8 SPECIFICATIONS

CLOCK

Crystal oscillator frequency	32,768 Hz
Accuracy	Within ±15 sec. per month (Normal temp.)
Read-out	Digital display of date, day, hours, minutes, and AM/PM
Calendar	Days, longer and shorter months, and leap years from 1901 to 2099 inclusive are programmed.
Alarm	4 alarm time settings 4 different tones (electronic buzzer). Minimum of 1 minute intervals between alarm settings
Time setting	Direct setting by key operation

STOPWATCH

Timing capacity	9 hours 59 minutes 59 seconds 9/10ths of a second
Timing unit	1/10th of a second
Timing modes	Normal, net time and lap time
Read-out	Digital display of hours, minutes, seconds and fractions of second

CALCULATOR

Functions	Basic functions, constant calculations, time calculations, date calculations and mixed calculations
Capacity	Four basic functions . . . . 8 digits Time calculations . . . . Up to 99 hours Date calculations . . . January 1, 1901 ~ December 31, 2099
Read out	Entry and answer with unnecessary zeroes suppressed
Decimal point	Full-floating decimal system with underflow
Overflow check	Indicated by the "E" sign in first column, locking the calculator

COMMON SECTION

Main components	One chip LSI, C-MOS-LSI, crystal oscillator (fork type)
Display tube	8-digit Digitron tube

Power source	AC and DC
	AC: 100, 117, 220 or 240V (±10V), 50/60Hz, with applicable AC Adaptor.
	DC: Clock — 2 silver oxide batteries (G-13)
	      Display — 1 AA-size dry battery (UM-3, SUM-3, or AM-3)
	Battery life:
	    Clock — G-13: one year or more

	Display — UM-3 : about 10 hours in case of continuous use
Usable temperature	0°C ~ 40°C (32°F ~ 104°F)
Power consumption	0.15 W
Dimensions	33 (h) x 144 (w) x 64 (d) mm (1-3/8" H x 5-5/8" W x 2-1/2 D)
Weight	148 g (5.2 oz) including batteries