CASIO®

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OPERATION MANUAL
MANUAL DE OPERACION

BIRTHDAY MELODY PAGE 66

CASIO ML-88

英 西

Dear customer,

Congratulations on your purchase of this unique electronic music clock/calculator.

This new product offers you the following functions; clock (hr., min., sec. & AM/PM), calendar (yr., mon., date & day), two alarms, alarm timer, stopwatch and full calculating conveniences, yet it includes a surprisingly new music instrument function.

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

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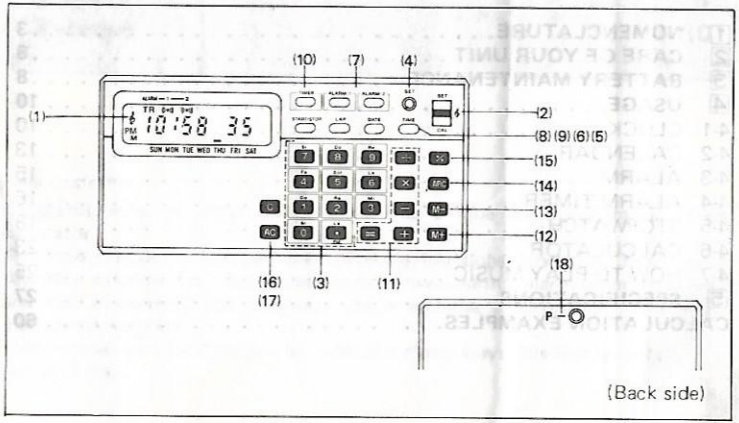
1 NOMENCLATURE



(1) Read-out

In the clock mode it shows hour, minute, second, PM and day of the week. In the calendar mode it shows year, month, date and day of the week.
In the alarm function it can hold and show two preset times (hour, minute and PM with symbol No. AL 1/AL 2).
As an alarm timer or stopwatch it shows the time being measured.
As a calculator it shows each entry and result, suppressing unnecessary 0's (zeros).

(2) Mode selection switch

SET: Used for setting the clock, calendar, 2 alarms and alarm timer. It is advisable that after setting these functions, the switch be set at "CAL" position to perform all functions including calculations.

𝄞 : The unit can be used as a musical instrument. Using numeral and ⓪ keys, music can be played. It plays music at each preset alarm time instead of buzzing and/or when an alarm or timer key is pressed. Time signals sound every hour on the hour.

CAL: Calculations can be performed.

(3) ⓪ – ⑨ , ⓿ Numeral and decimal point keys

Enter numerals. For decimal places, use the ⓪ key in its logical sequence.
The ⓿ key also operates the "PM" sign for time setting.
Pressing these keys, music can be played with the mode selection switch at "𝄞" position.

(4) SET Set button
Sets the clock and calendar.

(5) TIME Time key
Displays the clock.

(6) DATE Date key
Enters year, month and day for calendar setting or date calculations.
Displays calendar by pressing DATE or AC DATE.

(7) ALARM-1/ALARM-2 Alarm-1/Alarm-2 keys
Set alarm 1 and alarm 2 by depressing ALARM-1 and ALARM-2, respectively.
Retrieves the time preset for alarms by pressing ALARM-1/ALARM-2, or AC ALARM-1/AC ALARM-2, and music sounds when the mode selection switch is set at "𝄞" position.
To stop the buzzer or music, press ALARM-1, ALARM-2 or TIMER.

(8) START/STOP Start/Stop key
Controls start/stop of stopwatch in any mode.
In the "𝄞" mode, each press of the START/STOP key immediately after numerals are entered or displayed gives out a note, starting with the leftmost numeral.
Likewise, the minus sign can be confirmed by depressing the START/STOP key.

(9) LAP Lap key
While timing the stopwatch, used to measure the individual lap times and/or recalls stopwatch mode when using the unit in another mode.

(10) TIMER Alarm timer key
Sets the alarm timer and then countdown starts.
Recalls alarm timer display when using the unit in another mode, and music sounds when the mode selection switch is set at "𝄞" position.

(11) ⊞ , ⊟ , ⊠ , ⊡ , ⊜* Function command and equal keys
Perform the four basic and mixed calculations with the mode selection switch at "CAL" position. An incorrect function command (⊞, ⊟, ⊠ or ⊡) is automatically cleared by touching the correct function command key. The ⊜ key obtains the answer after entering numerals and function commands.

(12) M+ * Memory plus key
Adds the displayed number to the memory. Obtains answer in four functions and automatically accumulates it into the memory positively.

(13) M− * Memory minus key
Subtracts the displayed number from the memory. Obtains the answer in four functions and automatically accumulates it into the memory negatively.

Replacement of batteries:

1) Open the battery cover of the unit by loosening the screws with a screwdriver.
2) Remove dead batteries.
3) Insert new batteries correctly according to the illustration on the back of the unit.
4) Replace the cover and screw carefully.
5) Keep pressing the "P" button on the back of the unit more than one second and confirm that "0" (zero) is displayed. If not, repeat the above operation.

* Before inserting the new batteries, be sure to thoroughly wipe them off with a dry cloth to maintain good contacts.
* Be sure to replace ***both*** batteries.
* Do not leave dead batteries in the battery box as they may cause malfunctions.
* Remove the batteries when not using for an extended period.
* Removing the batteries clears all preset data.

Note:

a) Avoid to keep pressing a numerical key or the ▣ key unnecessarily in the " ♭ " mode, or the continuation of sound will shorten battery life. (To save battery life, the duration of a note is limited to about 1 to 2 minutes.)

b) Original batteries supplied with the unit are estimated to last 12 months from the date of installment at the factory, not from the date of purchase.

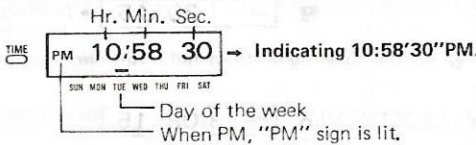
4 USAGE

4-1. CLOCK

■ Read-out example

* The following operation can be made with the mode selection switch at any position.

OPERATION	READ-OUT



Ex.) Readjusting a loss (when second display is 30 to 59.)

OPERATION	READ-OUT
	PM 10:58 35
(Time signal of 10:59 PM) SET	PM 10:59 00 → (25 second loss is adjusted to zero.)

4-2. CALENDAR

■ Read-out example

* The following operation can be made with the mode selection switch at any position.

OPERATION	READ-OUT
	Yr. Mon. Date
a) AC DATE b) DATE (while time display) b') When the DATE key is released the display reconverts to regular time.	82-12-02 → Indicating December 2 (Thu.), 1982 SUN MON TUE WED THU FRI SAT └Day of the week

* Read-out for the year, 2000 to 2099, hyphens between numbers are not displayed.

■ Setting calendar

Ex.) Setting December 2 (Thursday), 1982

OPERATION	READ-OUT
Mode switch → "SET" AC	0.
(Entry of date) 82 DATE 12 DATE 02	82-12-02
SET	82-12-02 → Indicates that calendar is set. SUN MON TUE WED THU FRI SAT └Day of the week appears automatically.

Note:

* The calendar can be set by entering only the last 2 digits for the year, 1901 to 1999. Enter the full 4 digits for the year, 2000 to 2099.
* To correct a wrong entry, press C or AC and start the above key operation all over again, or wrong entry of month or date can be corrected by simply reentering the correct month or date.
* Since the calendar is permanently programmed (from January 1, 1901 to December 31, 2099), no date adjustment is required for irregular months or leap years.
  However, after removing batteries, the present date must be set.

4-3. ALARM

Two alarm times (hr. and min.) can be preset.

Alarm 1: (Repeat) Once the alarm is set, the electronic buzzer sounds for 20 seconds or music (FRÜHLINGSLIED) sounds for 24 seconds at each preset time with the mode selection switch at " 𝄞 " until the alarm is cleared.

Alarm 2: After presetting the alarm, the electronic buzzer sounds for 20 seconds or music (TRÄUMEREI) sounds at the preset time for 24 seconds with the mode selection switch at " 𝄞 " and the alarm is cleared.

■ Setting alarm

Ex.) Setting Alarm 1 to 6:30 AM
Setting Alarm 2 to 11:05 PM

OPERATION		READ-OUT
Mode switch → "SET"	AC	0.
(Enter hr. and min.)	630	630.
(Presetting alarm 1)	ALARM-1	6:30 AL1 → The " ((•)) " sign indicates that alarm is set.
(Presetting alarm 2)	1105 P.M. ALARM-2	PM 11:05 AL2

When PM, "PM" sign is lit. ┘ Hr. Min. └ Alarm No.

Note:

* To correct a wrong entry, press C or AC and start the key operation all over again.
* The preset alarm times can be changed by making new alarm settings. To clear alarm settings, press AC ⊡ ALARM-1 (or ALARM-2) in sequence.
* To read the preset alarm time, simply press ALARM-1 or ALARM-2.
  When the unit is in the clock mode, the alarm time can be read only while the alarm key is being depressed.
  When the mode switch is set to " 𝄞 ", the alarm time can be displayed with music by pressing alarm key.
* To stop the buzzer or music, press ALARM-1, ALARM-2 or TIMER.

4-4. ALARM TIMER

Once the alarm timer is set, countdown starts and the electronic buzzer sounds for 20 seconds or music (MOMENTS MUSICAUX NO. 3) is played 24 seconds at the predetermined setting with the mode switch at " 𝄞 ".

■ Setting the alarm timer

Time can be set up to 23 hours, 59 minutes and 59 seconds. Countdown continues in 1/10th of a second steps.

Ex.) Setting the timer for a 1 hour and 30 minutes period.

OPERATION		READ-OUT	
Mode switch → "SET"	AC	0.	
(Enter hr. and min.)	130	130.	
(Start)	TIMER	TR 1:29 59.9	→ The "TR" sign flashes indicating that alarm timer is set and count-down starts.
(Electronic buzzer or music sounds and the alarm timer is cleared.)		0:00 00.0	

Note:

* To correct the entry, press CT or AC, and enter the correct number.
* To set the alarm timer to 1 hour, 10 minutes or 10 seconds, press AC 1 TIMER, AC 010 TIMER or AC 0010 TIMER.
* When setting alarm timer, 12 hours can be added by pressing 12/24.
* To reset alarm timer, press AC 0 TIMER in sequence.
* To cut off the buzzer or melody, press ALARM-1, ALARM-2 or TIMER.
* By pressing TIMER the alarm timer can be read in any mode.

4-5 STOPWATCH

Normal, net and lap timings are possible up to 23 hours, 59 minutes and 59.9 seconds in 1/10th of a second steps.
The moment the time reaches 24 hours, the stopwatch reverts to "0" and restarts timing.
* Timing is possible with the mode selection switch at any position.

■ Normal time measurement

Measurement:

START 0 → STOP a
START 0 → STOP b
START 0 → STOP c

Ex.) 100-meter track race

Operations:

Reset (AC) → Start → Stop

Time: 13.5 secs. 0:00 13.5 Reset (AC)

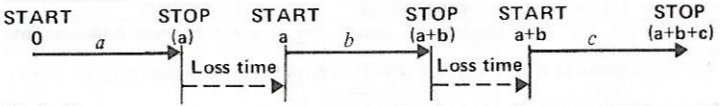
Press START/STOP at start signal.

Press START/STOP when the runner reaches the finish line.

Record the time measured.

■Net times (Accumulated time excluding loss time)

Measurement:



Ex.) Soccer game

Operations:

Reset (AC) Start → Stop

Time from start: 17 mins. 3.4 secs.

0:17 03.4

Press START/STOP at kick-off.

Press START/STOP when the game is suspended. (Timing is discontinued.)

Restart → Stop

Finish of the first half of game

0:45 00.0

Reset (AC)

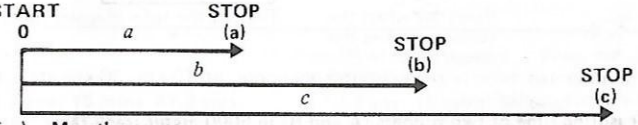
Press START/STOP. (Timing restarts from 17 mins. 3.4 secs.)

Press START/STOP when the 45 mins. is indicated.

* Whenever the game is suspended, repeat the above operations.

■Lap timing

Measurement:



Ex.) Marathon race

Operations:

Reset (AC) Start → Stop (5-km point)

Time: 18 mins. 17.5 secs.

0:18 17.5

Press START/STOP at start signal.

Press LAP and the time display is stopped. (Timing continues in a secondary circuit.)

Record the time measured.

Lap release → Stop (Turning point)

Time: 1 hr. 24 mins. 53.2 secs

1:24 53.2

Press LAP. (The stopped time is unlocked and timing from the start time continues.)

Press LAP.

Record the time measured.

Time: 2 hrs. 58 mins. 45.7 secs.

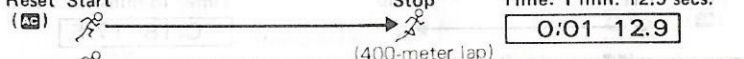
2:58 45.7

Record the total elapsed time.

* When another lap time is required (for example, at 10-km, 30-km etc.), repeat the above operations.

Ex.) Measuring time of two runners (A and B) in 5000-meter track race.

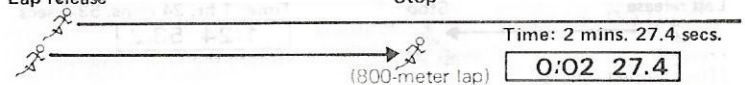
Operations:



Time: 1 min. 12.9 secs.

0:01 12.9

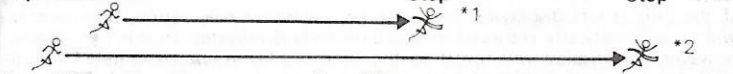
Record the time measured. (400-meter lap time of A)



Time: 2 mins. 27.4 secs.

0:02 27.4

Record the time measured. (800-meter lap time of B)



***1 Time: 15 mins. 47.8 secs.**

0:15 47.8

Record the total elapsed time of A.

***2 Time: 15 mins. 54 secs.**

0:15 54.0

Press LAP and record the total elapsed time of B.

* When another lap time is required, repeat the above operations.
* While timing a game, the unit can be used in another mode without affecting the timing.
  By pressing *1 (AC), ALARM-1, ALARM-2, TIMER, TIME or DATE the unit can be converted to a calculator, or alarm-1, alarm-2, the timer, clock or date can be displayed. In addition, the stopwatch mode can be retrieved by pressing LAP key.
*1 When the stopwatch is stopped, the accumulated time is cleared by pressing (AC) key.

Note:
If the unit is left displaying the calendar, alarm or calculation, time display will be automatically retrieved in approximately 6 minutes. In the " 𝄞 " mode, however, the display will revert to the time display in approximately 1 minute after the last note is played by pressing a numeral key (0 – 9), ■ key or START/STOP key (See the " START/STOP key" on page 5).

4-6 CALCULATOR

* Calculations can be performed without affecting other functions: clock, calendar, stopwatch, etc.
* Be sure to press AC prior to starting calculations.
* When the alarm or alarm timer buzzer or melody sounds while calculating, no entry can be made, but the ALARM-1, ALARM-2 or TIMER key can be pressed to cut off the buzzer. The moment that the sound stops, the subsequent calculation can be continued.
* If another function is activated while calculating, calculation is cleared except the contents of the memory.
* Overflow is indicated by an "E" sign and stops the calculation.

Overflow occurs:
a) When the integer part of an answer, whether intermediate or final, exceeds 8 digits (7 digits for negatives).
b) When the integer part of an accumulated total in the memory exceeds 8 digits (7 digits for negatives).

In the case of a), 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.

To release the overflow check, press the AC or C key.
AC clears the entire machine except the memory.
C clears only the "E" sign and the displayed approximate number can be utilized in subsequent calculations.

Memory protection:
The content of the memory is protected against overflow, and the accumulated total is recalled by the MRC key after the overflow check is released by the AC or C key.

4-7 HOW TO PLAY MUSIC

By setting the mode selection switch to "𝄞", the unit can be played as a musical instrument, and at a preset time, the alarm or timer plays programmed music instead of buzzing.

■Manual playing of music melody

Pressing numeral keys including 0 according to following musical scales, melody can be played.

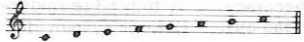
La Si Do Re Mi Fa Sol La Si Do Re

0 0 1 2 3 4 5 6 7 8 9 (Relative pitch)

* Each time a numeral key is pressed, a note is played, so the duration of each note and intervals between the notes can freely be controlled.
* When this unit is used as a calculator with the mode selection switch in "𝄞" position, a note is played each time a numeral key is pressed, and when a key (=, ×, M+, M−, or MR) is pressed, a note or notes are played depending on the digits forming the answer.

Ex.) 12345678 x 1 = 12345678

OPERATION	READ-OUT
12345678×1=	𝄞 12345678.



■Playing three pieces of programmed music

By pressing ALARM-1, ALARM-2 or TIMER, the preset alarm time or alarm timer can be read out, and the following three pieces of music is played automatically.

ALARM-1 : FRÜHLINGSLIED (24 seconds)
ALARM-2 : TRÄUMEREI (24 seconds)
TIMER : MOMENTS MUSICAUX NO. 3 (24 seconds)

■Time signal

After setting the clock, a time signal for every hour on the hour sounds automatically with the mode selection switch at "𝄞".

5 SPECIFICATIONS

■CLOCK

Crystal oscillator frequency: 32,768 Hz
Accuracy: Within ±3 seconds per day (at 15°C–35°C or 59°F–95°F).
Read-out: 12-hour system digital display of hour, minute, second, and PM and day.
Time setting: Direct setting by key operation.
Adjustment: Readjusting an error within ±30 seconds at one touch.

■ALARM

Alarm 1: Electronic buzzer (20 sec.) or musical melody (FRÜHLINGSLIED, **(Repeat)** 24 sec.).
Alarm 2: Electronic buzzer (20 sec.) or musical melody (TRÄUMEREI, 24 sec.).
Sign: " (•••) "

■CALENDAR

Programmed range: January 1, 1901 through December 31, 2099.
Read-out: Year, month, date and day.

■ALARM TIMER

Time setting: Up to 23 hours, 59 minutes and 59 seconds.
Timing step: 1/10th of a second.
Read-out: Digital display of hour, minute, second and 1/10th of a second.

Buzzer: Electronic buzzer (20 seconds) or musical melody (MOMENTS MUSICAUX NO. 3, 24 sec.).
Sign: "TR"

■STOPWATCH

Measuring capacity: Up to 23 hours, 59 minutes, 59.9 seconds.
Measuring step: 1/10th of a second.
Measuring type: Normal, net, lap timings.

■ELECTRONIC MUSICAL INSTRUMENT FUNCTION

Manual or programmed melody playing.
Time signal every an hour.

■CALCULATOR

Abilities: Four basic calculations, four functions with a constant, automatic accumulation in four functions, direct access to the memory, percentage calculations including add-ons/discounts, mark-ups, increase, decrease and ratio; and date calculations.
Capacity: 8 digits including a minus (–) sign.
Read-out: Suppresses unnecessary 0's (zeros), function command sign and mode symbol display.
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.

■TYPE OF DISPLAY
Liquid crystal

■MAIN COMPONENT
One chip C-MOS-LSI, crystal oscillator.

■POWER CONSUMPTION
0.013 W

■POWER SOURCE
Two alkaline-manganese batteries (Type: LR44).
Two silver oxide batteries (Type: SR44 (G-13), UCC357, 10L14, RW-22 or RW-42).
The unit gives approximately 12 months continuous operation on type LR44 (approximately 18 months on type SR44 (G-13)).

■USABLE TEMPERATURE
0°C – 40°C (32°F – 104°F)

■DIMENSIONS
7.9 H x 114 W x 56.5 mm D
(5/16" H x 4-1/2" W x 2-1/4" D)

■WEIGHT
58g (2 oz) including batteries.

Estimado cliente:

Felicitaciones por la adquisición de este exclusivo calculador/reloj musical.
Este nuevo producto le ofrece las funciones siguientes: reloj (con hora, minuto, segundo y am/pm), calendario (con año, mes, fecha y día), dos alarmas, contador de tiempo con alarma, cronómetro y todas las formas de cálculos convenientes; además, incluye la sorprendentemente nueva función de instrumento musical.
Este manual le permitirá a Ud. familiarizarse con las numerosas habilidades con que esta unidad, altamente capacitada, puede servirle.