CITIZEN®

INSTRUCTION MANUAL

Eco-Drive®

English

CONTENTS

A. BEFORE USING

This watch is powered not by an ordinary battery, but by converting photo energy to electrical energy.

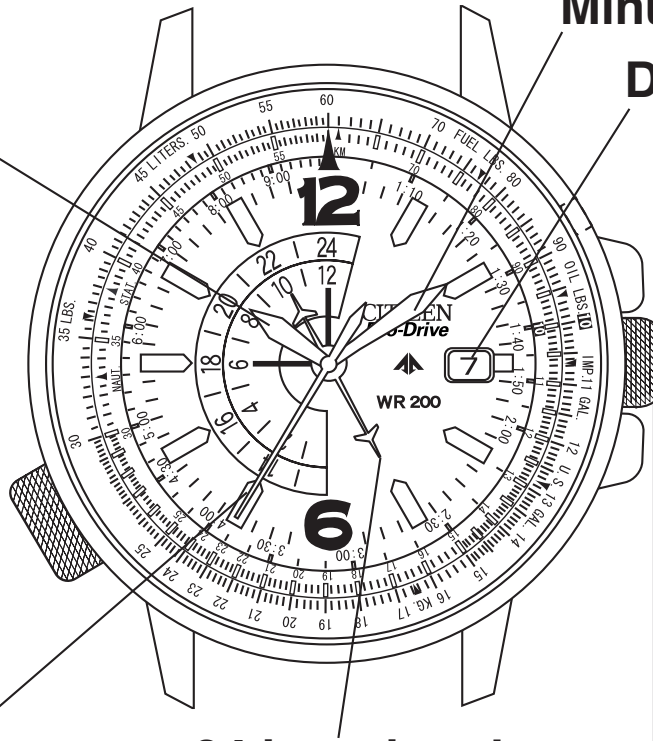
Before using, expose to light and make sure the watch is sufficiently charged.
See "G. TIME REQUIRED FOR CHARGING" for charging time reference.

A rechargeable cell is used in this watch to store electrical energy. **This rechargeable cell is a clean energy battery which doesn't use any toxic substances such as mercury. Once fully charged, the watch will continue to run for about 6 months without further charging.**

To use this watch comfortably, **make sure that the watch is always recharged before it stops.**

There is no concern for overcharging this watch. (Overcharge Prevention Function is included)
We recommend that you recharge the watch everyday.

B. SETTING THE TIME AND DATE



· The illustrations in this instruction manual may differ from the actual appearance of your watch.
· A solar cell is located under the dial.

■ Setting the Time

(1) Pull the crown out to the time correction position (2nd click position) to stop the second hand at 0. (The second hand stops when the crown is pulled out.)
(2) Turn the crown to set the **24 hour hand and minute hand** to the current time.
*At this time, the movement of the hour hand is linked with the movement of the 24 hour hand.
(3) **Use a time signal to synchronize the watch by pushing the crown back in to the normal position.** (The second hand begins to move when the crown is pushed in.)
(4) Pull the crown out to the date correction position. (1st click position)
(5) Turn the crown to the right (clockwise direction) and set the hour hand to the current time. Pay attention to AM and PM since the location of the hour hand where the date changes is approximately 12:00 midnight.
(6) Securely return the crown to the normal position.

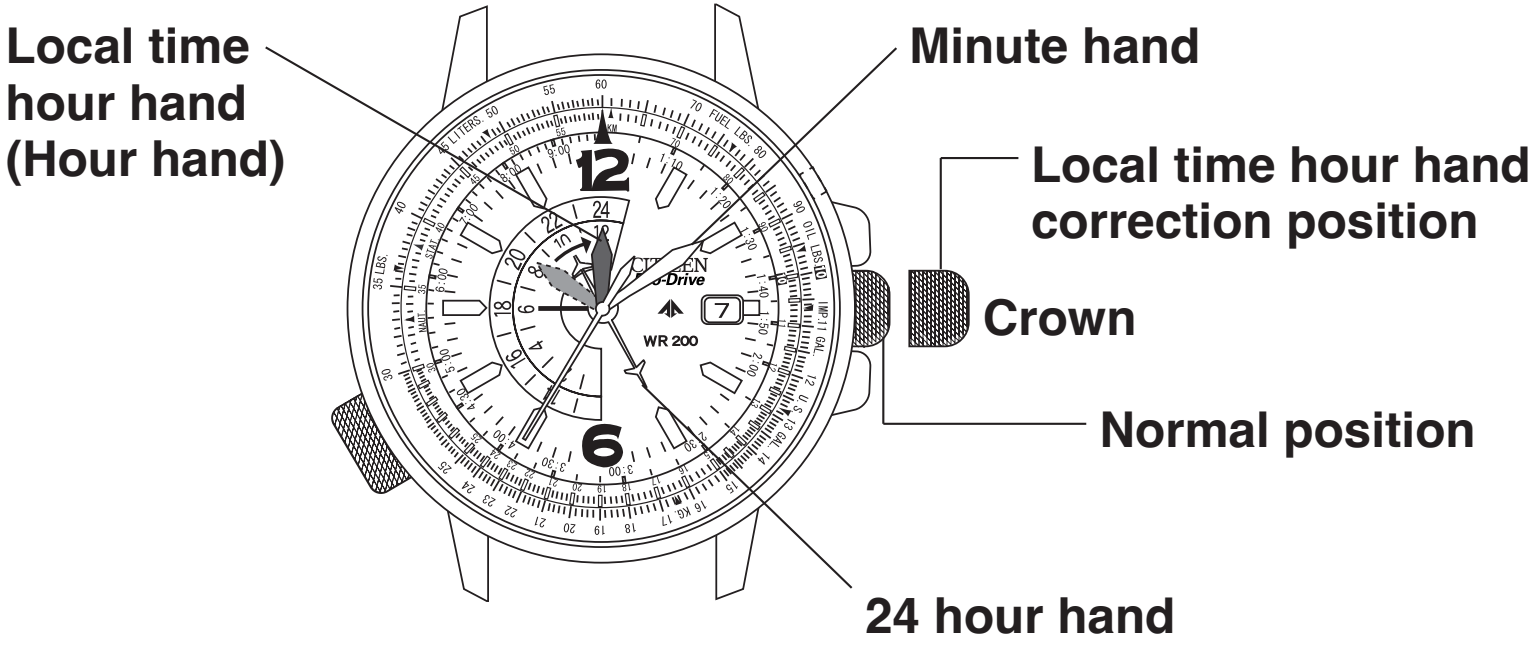
■ Setting the Date

(1) Pull the crown out to the date correction position.
(2) Turn the crown to the left (counter-clockwise direction) and set the date.
(3) Securely return the crown to the normal position.

* Since the date is linked to movement of the hour hand, the date changes when the hour hand approaches 12:00 midnight. Please note this operation when using as a dual time watch.
* Do not attempt to correct the calendar when the hour hand is between the hours of 9:00 PM and 1:00 AM. Setting the calendar during this time may result in the date not changing on the following day.

C. USING AS A DUAL TIME WATCH

This watch allows the hour hand only to be corrected independently without stopping the watch. It can be used as a dual time watch by setting the 24 hour hand and hour hand to different times. After correcting the time, the hour hand is used to indicate the "local time hours".



■ Correcting the Local Time Hours

(1) Pull the crown out to the local time hour hand correction position. (1st click position)

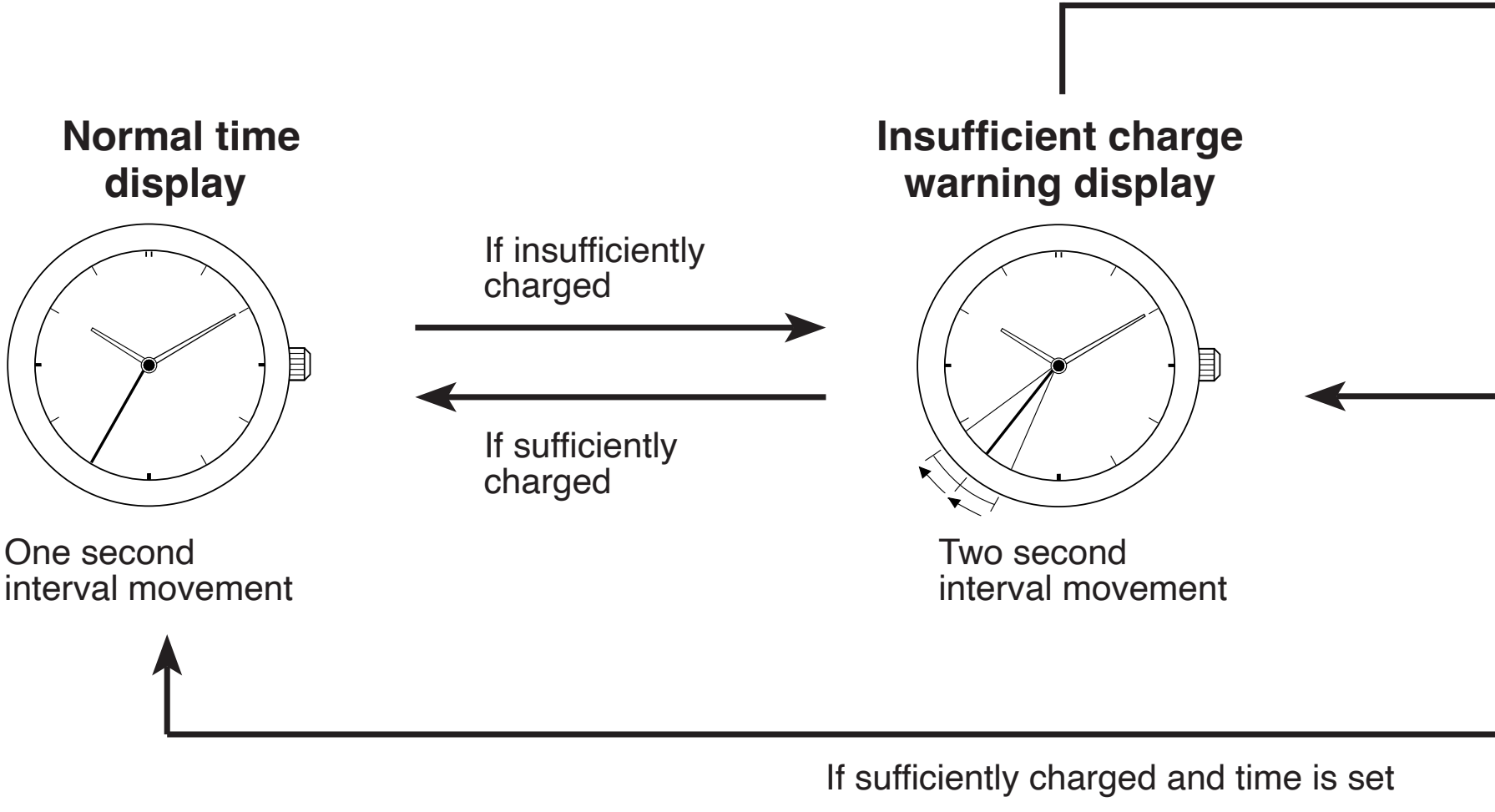
(2) Turn the crown to the right (clockwise direction) and set the local time hour hand to the desired time. The hour hand can be corrected in +1 hour increments in the clockwise direction. Set the time while paying attention to AM and PM.

(3) Securely return the crown to the normal position.

* In addition, since the calendar is linked with the operation of the hour hand, it may be necessary to correct the calendar after correcting the hand depending on the time to which it was set.

D. FUNCTIONS OF ECO-DRIVE WATCH

If the charge becomes insufficient, a warning function will operate and the movement of the second hand changes, as below.

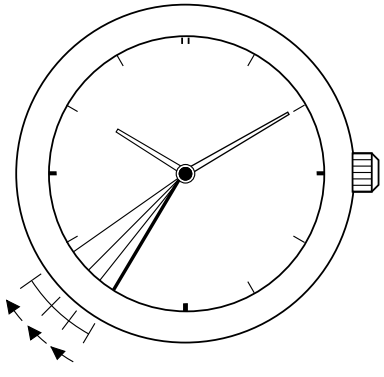


If insufficient charge continues

Stop

The watch will begin to operate soon after it is exposed to light due to Quick Start Function

Time setting warning display



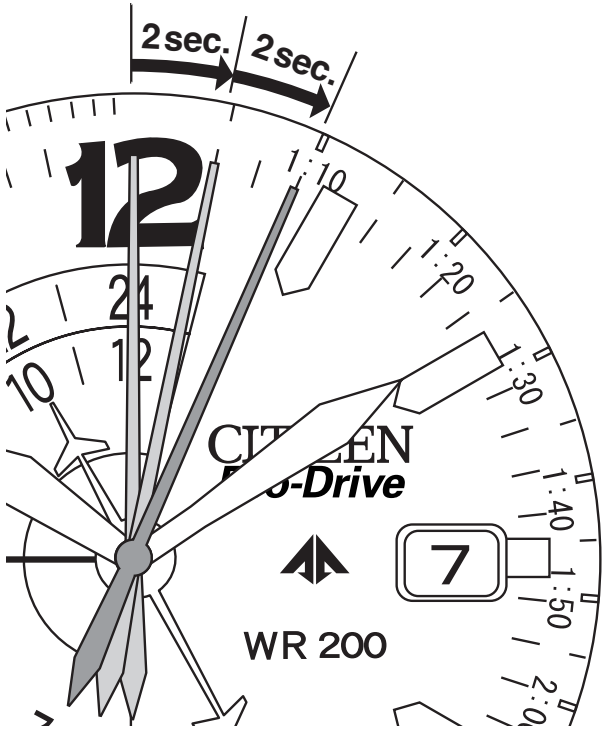
Hitch movement

If insufficiently charged and time is set

■ Insufficient Charge Warning Function

The second hand changes to a two second interval movement to indicate insufficient recharging.

Even in such a case, the watch keeps correct time, but about 3 days after the two second interval movement begins, the watch will stop. After exposing the watch to light, recharging takes place and the watch returns to one second interval movement.



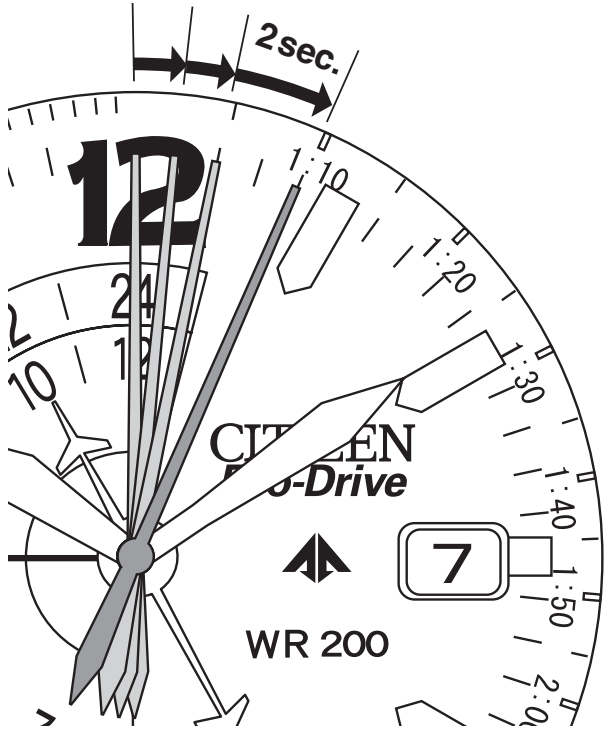
Two second interval movement

■ Quick Start Function

The watch will stop if it is completely discharged.
It will begin to operate soon after it is exposed to light.
(However, the time to start may vary according to the brightness of the light.)

■ Time Setting Warning Function (B877)

If the watch stops, subsequent exposure to light allows the Quick Start Function to start again, and **the second hand moves with a hitch to indicate that the time incorrect.**
In this case, quickly recharge the watch and reset the time.
Otherwise, the hitch movement will continue.



Hitch movement

■ Overcharge Prevention Function

There is no risk of overcharging.
Once the rechargeable cell is fully recharged, the overcharging prevention feature comes into operation and prevents overcharging.

E. CARE AND HANDLING DURING CHARGING

■ Notes on use

Take care to charge your watch during use.
Please note that if you wear long sleeves, the watch can easily become insufficiently charged because it is hidden and not exposed to light.

- When you take the watch off, place it in as bright a place as possible, and it will always continue to run properly.

■ Notes On recharging

- Avoid recharging at high temperatures (over about 60°C/140°F), otherwise the watch will be damaged during recharging.
  (eg) Charging the watch near a light source that easily becomes hot, such as an incandescent lamp or a halogen lamp.
  Charging in a place that easily becomes hot, such as a dashboard.

  When you charge the watch with an incandescent lamp, halogen lamp or other light source that generates heat, take a distance about 50cm (20in.) from the light source to prevent extremely high temperature.

F. REPLACING THE RECHARGEABLE CELL

Unlike ordinary batteries, the rechargeable cell used in this watch doesn't have to be periodically replaced due to repeated charging and discharging.

CAUTION

Never use another battery different from the rechargeable cell used in this watch.

The watch structure is so designed that a different kind of battery other than that specified cannot be used to operate it. In case a different kind of battery such as a silver battery is used by some chance, there is a danger that it will be overcharged to burst, causing damage to the watch and even to the human body.

G. TIME REQUIRED FOR CHARGING (B877)

Below are the approximate times required for charging when exposing the watch dial to light continuously. Please use this table as a reference only.

Environment	Illuminance (lx)	Charging time (approx.)		
		To work for one day	To start working normally when the cell is discharged	To become fully charged when the cell is discharged
Outdoors (sunny)	100,000	3 minutes	36 minutes	9 hours
Outdoors (cloudy)	10,000	10 minutes	2 hours	33 hours
20 cm (7-7/8 inches) from a fluorescent lamp (30 W)	3,000	30 minutes	7 hours	105 hours
Interior lighting	500	3 hours	44 hours	640 hours

* To charge the rechargeable cell fully, it is recommended to expose the dial to direct sunlight. A fluorescent lamp or interior lighting does not have sufficient illumination to charge the rechargeable cell fully.

TIME REQUIRED FOR CHARGING (B878)

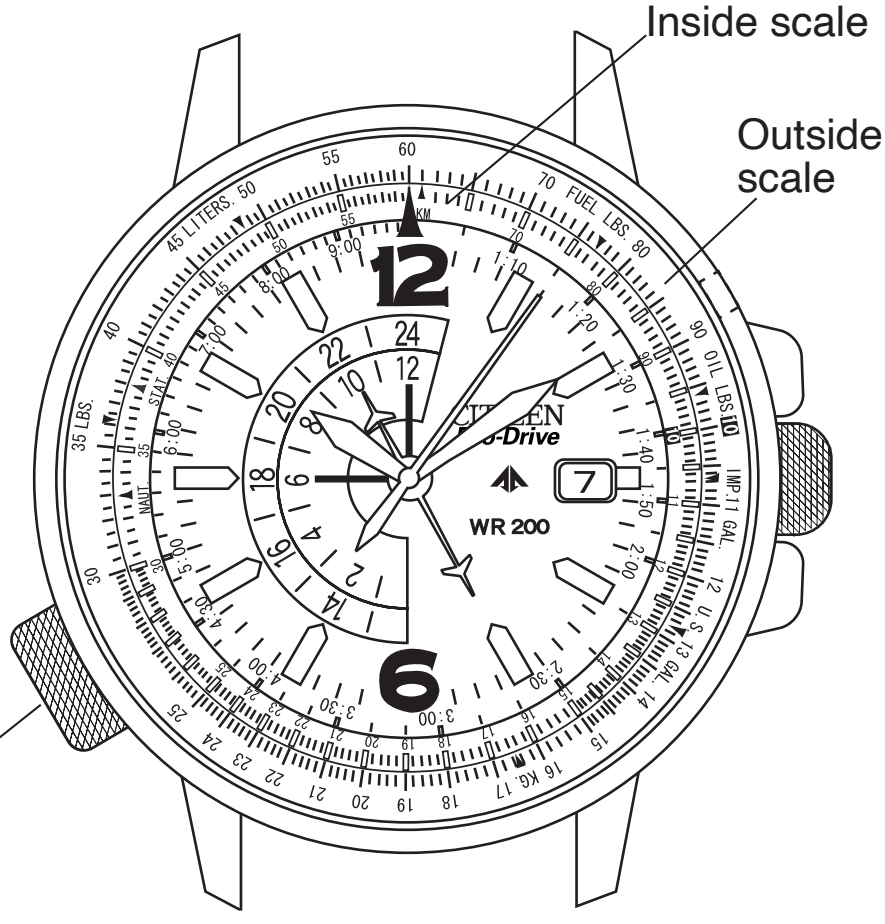
Below are the approximate times required for charging when exposing the watch dial to light continuously. Please use this table as a reference only.

Environment	Illuminance (lx)	Charging time (approx.)		
		To work for one day	To start working normally when the cell is discharged	To become fully charged when the cell is discharged
Outdoors (sunny)	100,000	2 minutes	12 minutes	8.5 hours
Outdoors (cloudy)	10,000	15 minutes	2 hours	80 hours
20 cm (7-7/8 inches) from a fluorescent lamp (30 W)	3,000	50 minutes	6.5 hours	250 hours
Interior lighting	500	5 hours	50 hours	—

* To charge the rechargeable cell fully, it is recommended to expose the dial to direct sunlight. A fluorescent lamp or interior lighting does not have sufficient illumination to charge the rechargeable cell fully.

H. USING THE SLIDE RULE

Flying distance and other navigation calculations as well as general calculations can be performed using the slide rule located around the outside of the dial. This slide rule is not able to display decimal places for calculation results, and should only be used as a general reference as an alternative to more accurate calculations. Turning the crown for turning the outer scale allows the slide rule around the dial (Outside Scale) to be rotated.

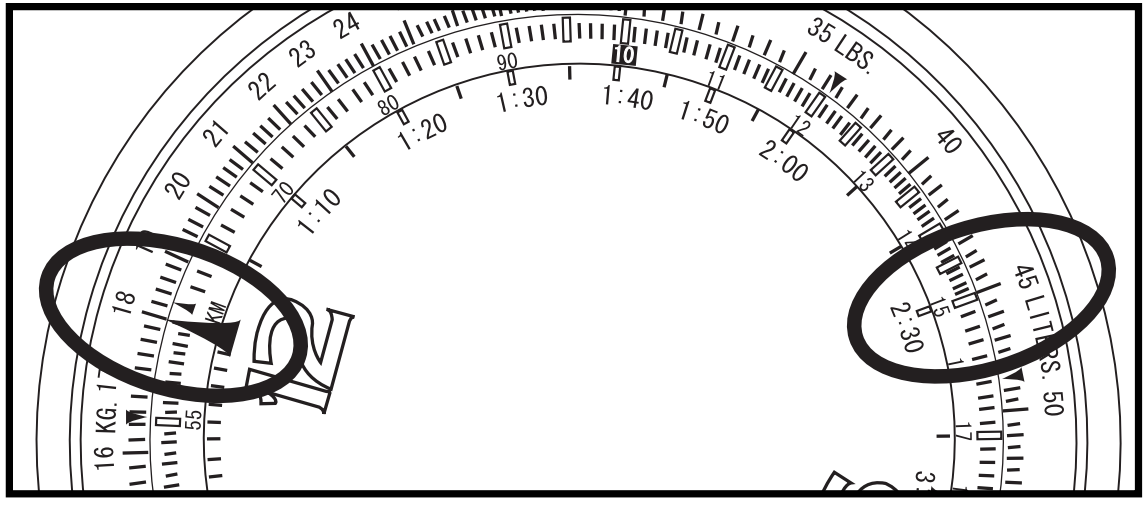


A. Navigation Calculator

1. Calculation of time required

Question: How long does it take an airplane flying at 180 knots to fly a distance of 450 nautical miles?

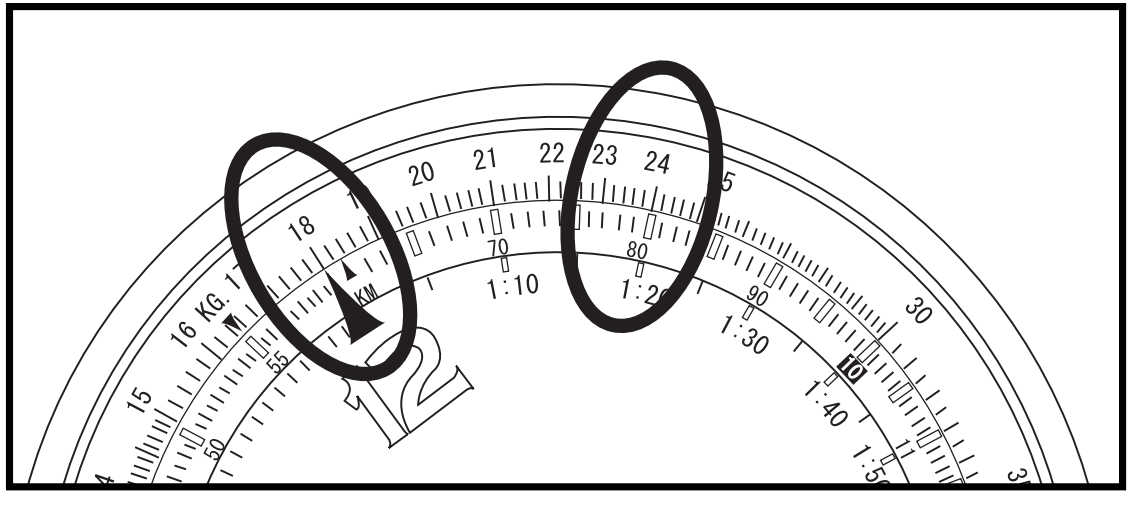
Solution: Set the 18 mark on the outside scale to the SPEED INDEX (▲). At this time, the point on the inside scale that is aligned with 45 on the outside scale indicates (2:30), and the answer is 2 hours and 30 minutes.



2. Speed (Ground Speed) Calculation

Question: What is the speed (ground speed) of an airplane when it takes 1 hour and 20 minutes to fly a distance of 240 nautical miles?

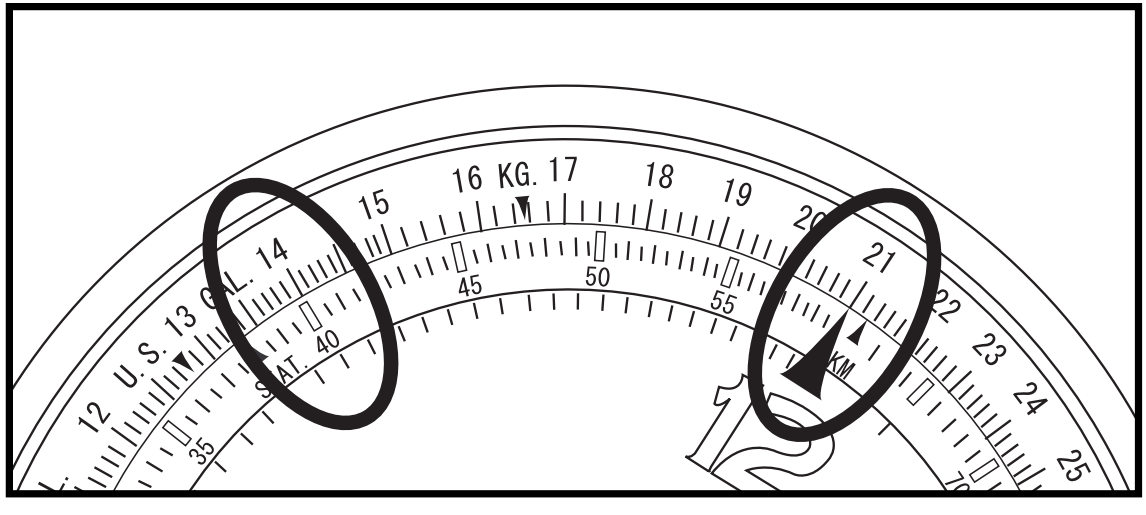
Solution: Align the 24 on the outside scale with 1:20 (80) on the inside scale. At this time, 18 is aligned with the SPEED INDEX (▲) on the inside scale, and the answer is 180 Kt.



3. Flying distance calculation

Question: What is the flying distance traveled in 40 minutes at a speed of 210 knots?

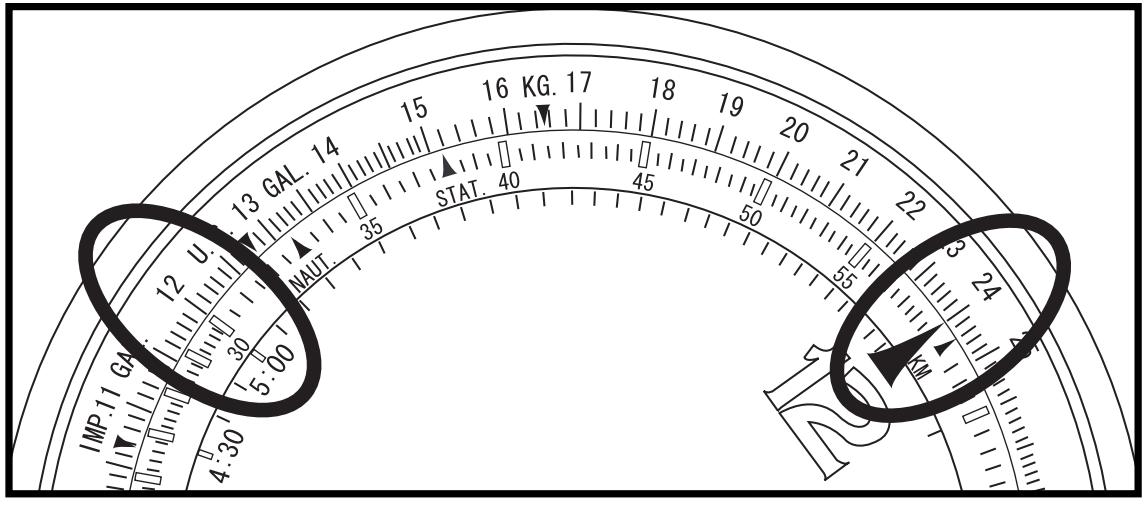
Solution: Align the 21 on the outside scale with the SPEED INDEX (▲) of the inside scale. The 40 of the inside scale is now pointing to 14, and the answer is 140 nautical miles.



4. Fuel consumption rate calculation

Question: If 120 gallons of fuel are consumed in 30 minutes' flying time, what is the fuel consumption rate?

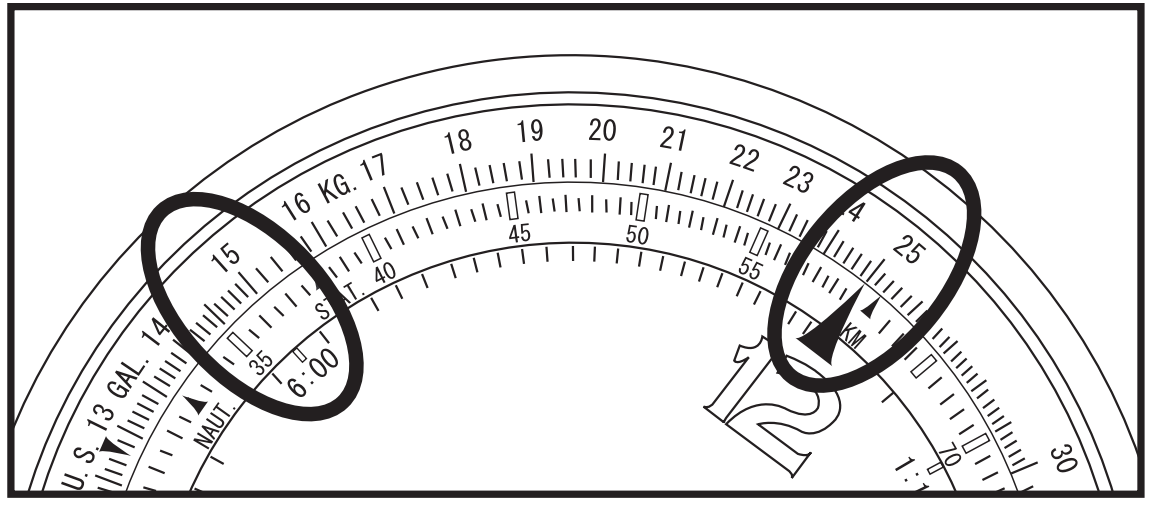
Solution: Align the 12 of the outside scale with 30 of the inside scale. The SPEED INDEX (▲) now points to 24, and the answer is 240 gallons per hour.



5. Fuel consumption calculation

Question: How much fuel is consumedin 6 hours at a fuel consumption rate of 250 gallons per hour?

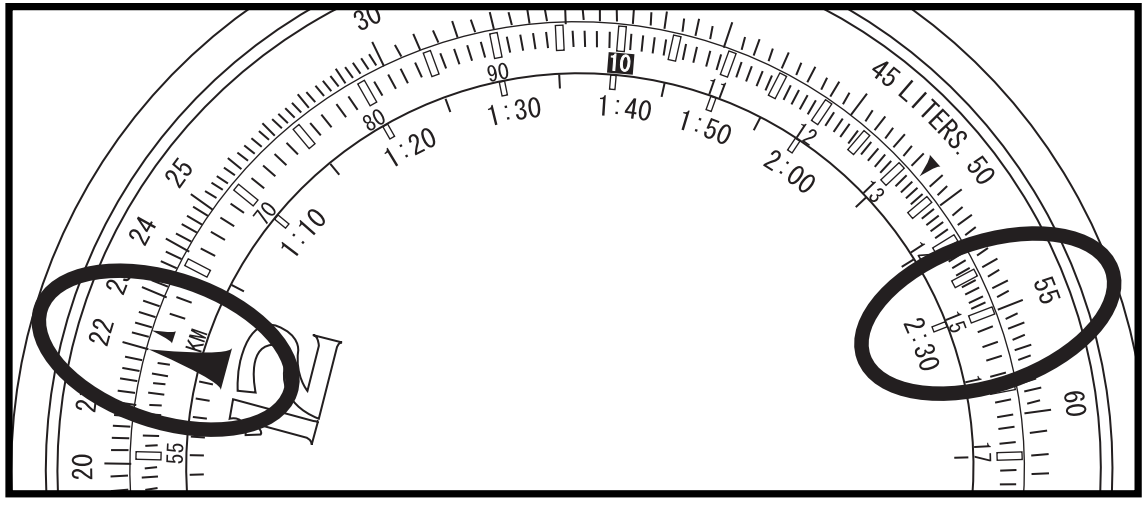
Solution: Align the 25 of the outside scale with the inside scale's SPEED INDEX (▲) of the inside scale. The 6:00 is aligned with 15, and the answer is 1500 gallons.



6. Maximum flying hours

Question: With a fuel consumption rate of 220 gallons per hour and a fuel supply of 550 gallons, what is the maximum number of flying hours?

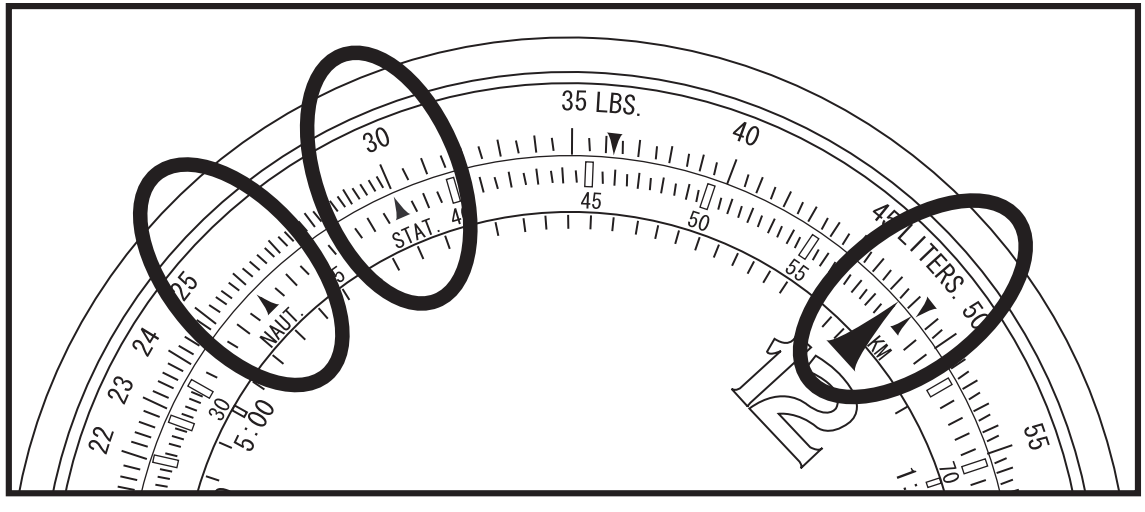
Solution: Align the 22 of the outside scale with the inside scale's SPEED INDEX (▲) of the inside scale. The 55 of the outside scale is now aligned with 2:30, and the answer is 2 hours and 30 minutes.



7. Conversion

Question: How do you convert 30 miles into nautical miles and kilometers?

Answer: Align the 30 on the outside scale with the STAT (▲) mark on the inside scale. At this time, 26 nautical miles is aligned at the NAUT (▲) mark on the inside scale, while the answer of 48.2 kilometers is aligned at the KM (▲) on the inside scale.

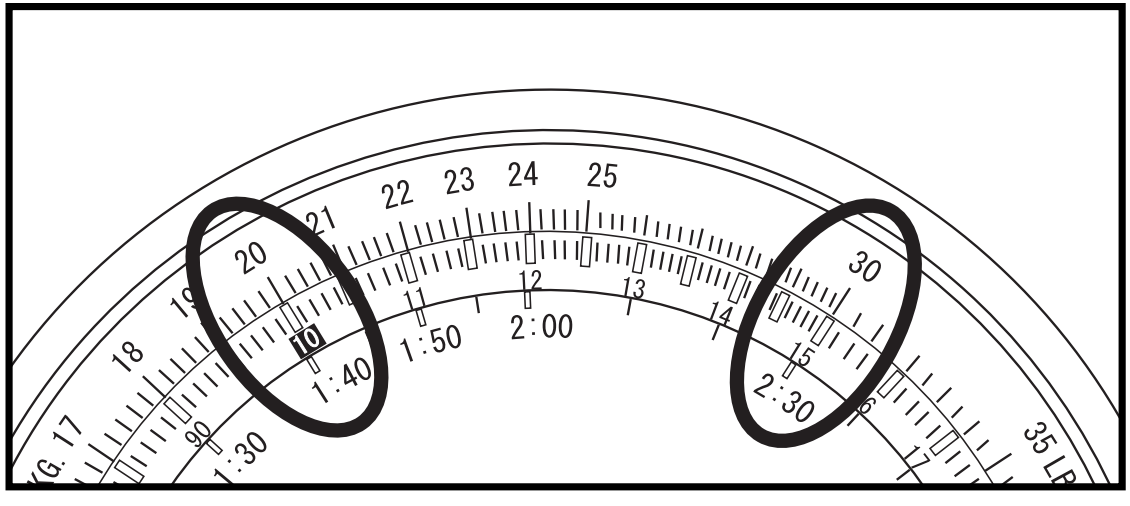


B. General calculation functions

1. Multiplication

Question: 20 × 15

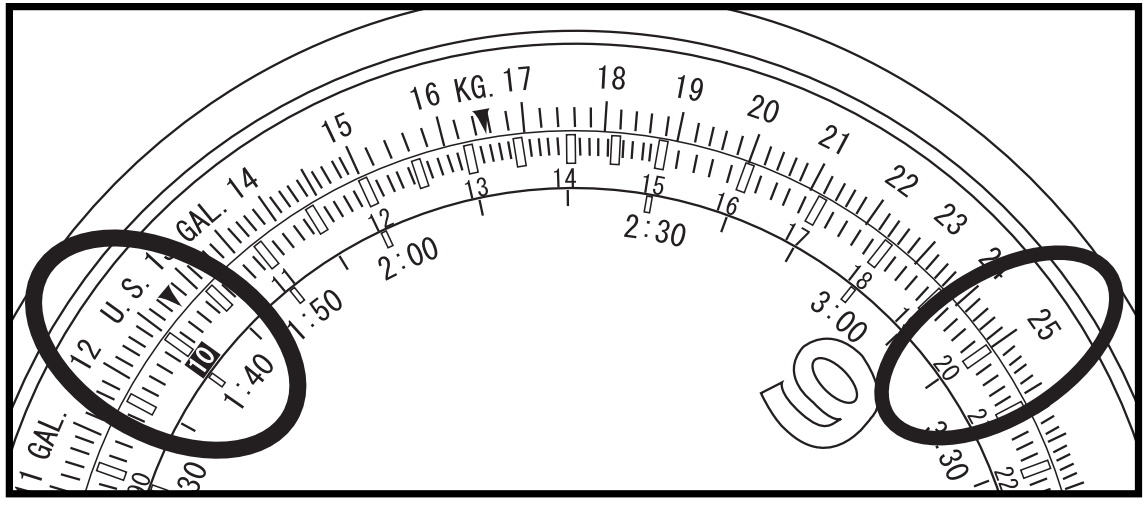
Solution: Align 20 on the outside scale with 10 on the inside scale, and read the outside scale at the 30 mark which is aligned with 15 of the inside scale. Figure the number of decimal places, and the answer is 300. Remember: decimal places cannot be read on this scale.



2. Division

Question: 250/20

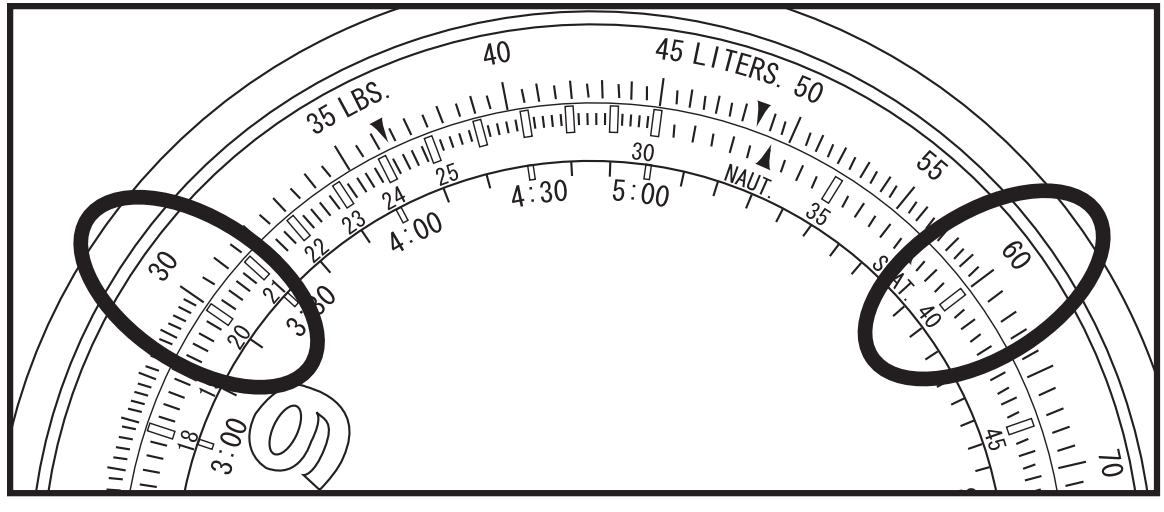
Solution: Align 25 on the outside scale with 20 on the inside scale. On the outside scale read the 12.5 mark that is aligned with 10 on the inside scale. figure the number of decimal places, and the answer is 12.5.



3. Reading Ratios

Question: 30/20 = 60/x

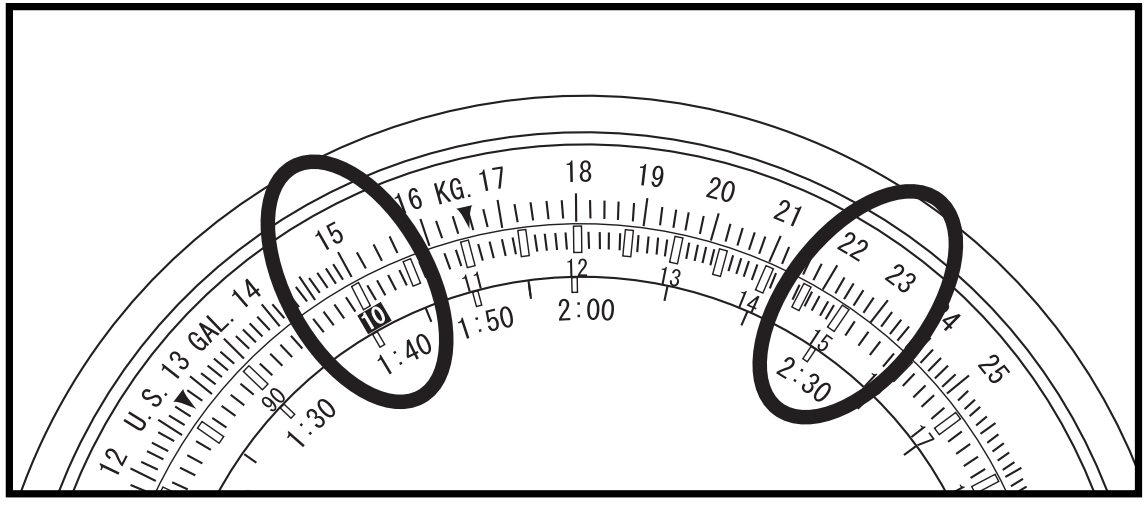
Solution: Align 30 on the outside scale with 20 on the inside scale. At this time, the answer of 40 can be read from the inside scale corresponding to 60 on the outside scale. In addition, the ratio of the value on the outside scale to the value on the inside scale is 30:20 at all positions on the scales.



4. Determining Square Root

Question: What is the square root of 225?

Solution: Rotate the scales so that the value on the inside scale corresponding to 22.5 on the outside scale is equal to the value on the outside scale corresponding to 10 on the inside scale, and read off the answer of 15 at that location.



I. PRECAUTIONS

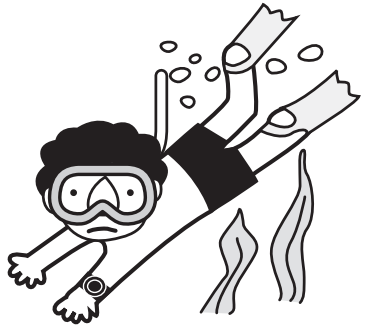
CAUTION: Water-resistance performance

There are several types of water-resistant watches, as shown in the following table.

Indication		Specifications	 Minor exposure to water (washing face, rain, etc.)
Dial	Case (case back)		
WATER RESIST or no indication	WATER RESIST(ANT)	Water-resistant to 3 atmospheres	OK
WR 50 or WATER RESIST 50	WATER RESIST(ANT) 5 bar or WATER RESIST(ANT)	Water-resistant to 5 atmospheres	OK
WR 100/200 or WATER RESIST 100/200	WATER RESIST(ANT) 10bar/20 bar or WATER RESIST(ANT)	Water-resistant to 10/20 atmospheres	OK

The unit "bar" is roughly equal to 1 atmosphere.

For correct use within the design limits of the watch, confirm the level of water-resistance of your watch, as indicated on the dial and case, and consult the table.

	Examples of use			
	 Moderate exposure to water (washing, kitchen work, swimming, etc.)	 Marine sports (skin diving)	 Scuba diving (with air tank)	 Operation of the crown with moisture visible
	NO	NO	NO	NO
	OK	NO	NO	NO
	OK	OK	NO	NO

* WATER RESIST(ANT) xx bar may also be indicated as W.R. xx bar.

- Water-resistance for daily use (to 3 atmospheres): This type of watch is water-resistant to minor exposure to water. For example, you may wear the watch while washing your face; however, it is not designed for use underwater.
- Upgraded water-resistance for daily use (to 5 atmospheres): This type of watch is water-resistant to moderate exposure to water. You may wear the watch while swimming; however, it is not designed for use while skin diving.
- Upgraded water-resistance for daily use (to 10/20 atmospheres): This type of watch may be used for skin diving; however, it is not designed for scuba or saturated diving using helium gas.

CAUTION

- Be sure to use the watch with the crown pressed in (normal position). If your watch has a screw-type crown, be sure to tighten the crown completely.
- Do NOT operate the crown with wet fingers or when the watch is wet. Water may enter the watch and compromise water-resistance.
- If the watch is used in seawater, rinse with fresh water afterward and wipe with a dry cloth.
- If moisture has entered the watch, or if the inside of the crystal is fogged up and does not become clear within a day, immediately take the watch to your dealer or Citizen Service Center for repair. Leaving the watch in such a state will allow corrosion to form inside.

- If seawater enters the watch, place the watch in a box or plastic bag and immediately take it in for repair. Otherwise, pressure inside the watch will increase, and parts (crystal, crown, buttons, etc.) may come off.

CAUTION: Keep your watch clean.

- Leaving dust and dirt deposited between the case and crown may result in difficulty in pulling the crown out. Rotate the crown while in its normal position, from time to time, to loosen dust and dirt and then brush it off.
- Dust and dirt tend to be deposited in gaps in the back of the case or band. Deposited dust and dirt may cause corrosion and soil your clothing. Clean the watch occasionally.

Cleaning the Watch

- Use a soft cloth to wipe off dirt, perspiration and water from the case and crystal .
- Use a soft, dry cloth to wipe off perspiration and dirt from the leather band.
- To clean a metal, plastic, or rubber watchband, wash away dirt with mild soap and water. Use a soft brush to remove dust and dirt jammed in the gaps in the metal band. If your watch is not water-resistant, take it to your dealer.

NOTE: Avoid using solvents (thinner, benzine, etc.), as they may mar the finish.

CAUTION: Operating environment

- Use the watch within the operating-temperature range specified in the instruction manual.
  Using the watch where temperatures are outside the specified range, may result in deterioration of functions or even stoppage of the watch.
- Do NOT use the watch in places where it is exposed to high temperature, such as in a sauna.
  Doing so may result in a skin burn.
- Do NOT leave the watch in a place where it is exposed to high temperature, such as the glove compartment or dash-board of a car.
  Doing so may result in deterioration of the watch, such as deformation of plastic parts.
- Do NOT place the watch close to a magnet.
  Timekeeping will become inaccurate if you place the watch close to magnetic health equipment such as a magnetic necklace or a magnetic latch of a refrigerator door or handbag clasp or the earphone of a mobile phone. If this has occurred, move the watch away from the magnet and reset the time.
- Do NOT place the watch close to household appliances that generate static electricity.
  Timekeeping may become inaccurate if the watch is exposed to strong static electricity, such as is emitted from a TV screen.

- Do NOT subject the watch to a strong shock such as dropping it onto a hard floor.
- Avoid using the watch in an environment where it may be exposed to chemicals or corrosive gases.
  If solvents, such as thinner and benzine, or substances containing such solvents come in contact with the watch, discoloration, melting, cracking, etc. may result. If the watch comes in contact with mercury used in thermometers, the case, band or other parts may become discolored.

J. SPECIFICATIONS

1. Type:	Analog Quartz with 4 Hands
2. Caliber No.:	B877/B878
3. Accuracy:	Within ±15sec/month (within a normal temperature range of +5°C/41°F to +35°C/95°F)
4. Quartz oscillator frequency:	32,768Hz
5. IC:	C/MOS-LSI (1 pc.)
6. Operational temperature range:	-10°C/14°F～ +60°C/140°F
7. Display features:	Time: hour (local time hour), minute, second, 24 hour clock Calendar: date
8. Additional features:	Insufficient charge warning Quick start Time setting warning (B877) Overcharge prevention
9. Continuous operating time:	Approx. 6 months (from full recharge to stop) (B877) Approx. 9 months (from full recharge to stop) (B878) Approx. 3 days (from two second interval movement to stop) (B877) Approx. 6 days (from two second interval movement to stop) (B878)
10. Battery:	Rechargeable cell (lithium button cell), 1pc

*Specifications are subject to change without prior notice.

Model No.BJ5＊・BJ7＊
Cal.B877・B878
CTZ-B8085⑪