SEIKO

セイコーシステム
ストップウオッチ

S149

取扱説明書
INSTRUCTION

CONTENTS

1.FEATURES

SEIKO Digital Stopwatch Cal. S149 is a time measuring device that can record the measurements with the use of the built-in printer. In addition, used with the stopwatch Cal. S143 or a grip switch, Cal. S149 can perform various functions.

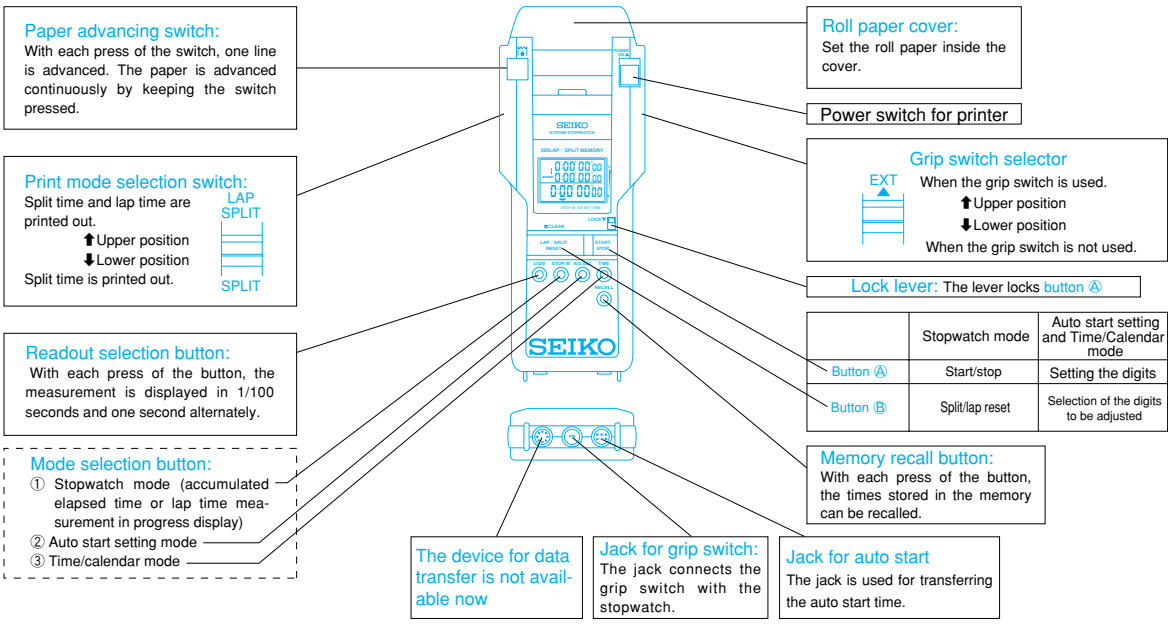
● Cal. S149 is suitable for measuring massive time date in a road race, marathon race, etc.

① With the use of the built-in printer, the measured time data can be printed out as soon as they are obtained.
② Year, month, date and time when the measurement is started can be printed out, and therefore, it is easy to file and keep the data.
③ An auto start function is provided. By presetting the time when the measurement is started, the stopwatch starts measuring automatically at the designated time.
④ Memory recall function·····Up to 300 measurement data can be stored in memory. Measurement data obtained from the start to finish of the measurement is recorded as a block without erasing the data in the previous block, and up to 100 blocks of data can be stored in memory.
This function is very useful for separately keeping the data measured at different time and date.
⑤ Besides, the stopwatch is equipped with such convenient functions as ID No. function useful for keeping the data of individual users separately, and memory capacity indicator and fastest lap time recall functions.
⑥ An antibacterial agent is applied to the case surface of the stopwatches.
*It loses its antibacterial effect gradually over time and the effective period differs depending on the conditions of use.

● Used with optional devices, the stopwatch can perform various functions.

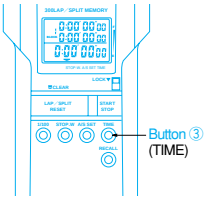
① By connecting the stopwatch to SEIKO Digital Stopwatch Cal. S143, etc., more than two stopwatches can start measuring simultaneously at a fixed time. Therefore, it is possible to measure the time in a road race or marathon at different checkpoints more accurately.
② Connected with a grip switch (optional accessory), the stopwatch can be operated more easily.
③ With the use of a paper extension holder (optional accessory), massive time data (approximately 2,500 data) can be measured successively at a time.

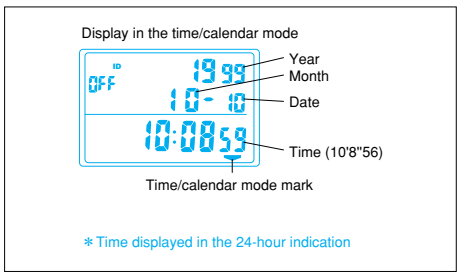
2.DISPLAY AND BUTTON/SWITCH OPERATION



3 .TIME/CALENDAR

1 Press mode selection button ③ (TIME) to set the time to the Time/calendar mode .





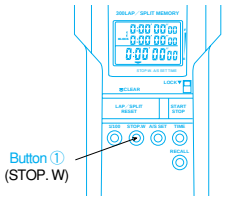
4 .HOW TO USE THE STOPWATCH

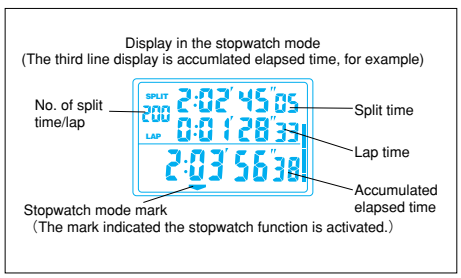
Notes on the block of data in memory

- The SEIKO Stopwatch Cal. S149 features a "Block Memory" stopwatch operation system. The data obtained from start till finish of a race is recorded as a block and stored in memory.
- The time and date of starting the measurement of a block of data are automatically stored in memory.
- Before the measurement is started, the block number is assigned to the block of data to be measured.
- Up to 300 data can be stored in memory.
- A block of data includes at least three data. If more than one block is used to store the data, the memory become full even before the number of lap time/split time measurements in memory amounts to 300.

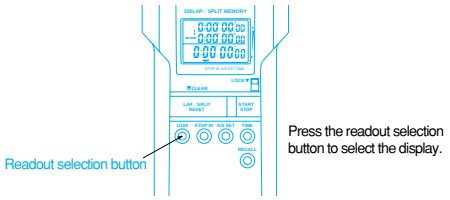
1 Press mode selection button ① (STOP. W) to set the stopwatch to the Stopwatch mode .

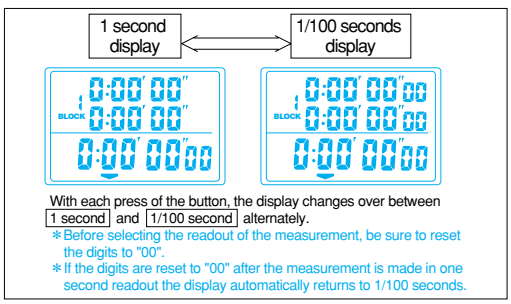
∗With each press of button① the third line display changes over between accumlated elapsed time and lap time measurement in progress alternately.





2 Select the readout of the measurement between 1/100 seconds and 1 second.

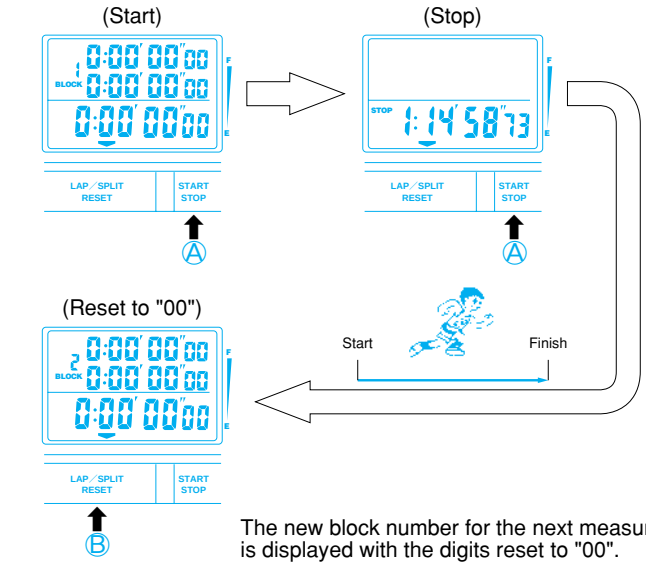




3 Now measurement starts. (Use the buttons Ⓐ,Ⓑ)

Standard measurement

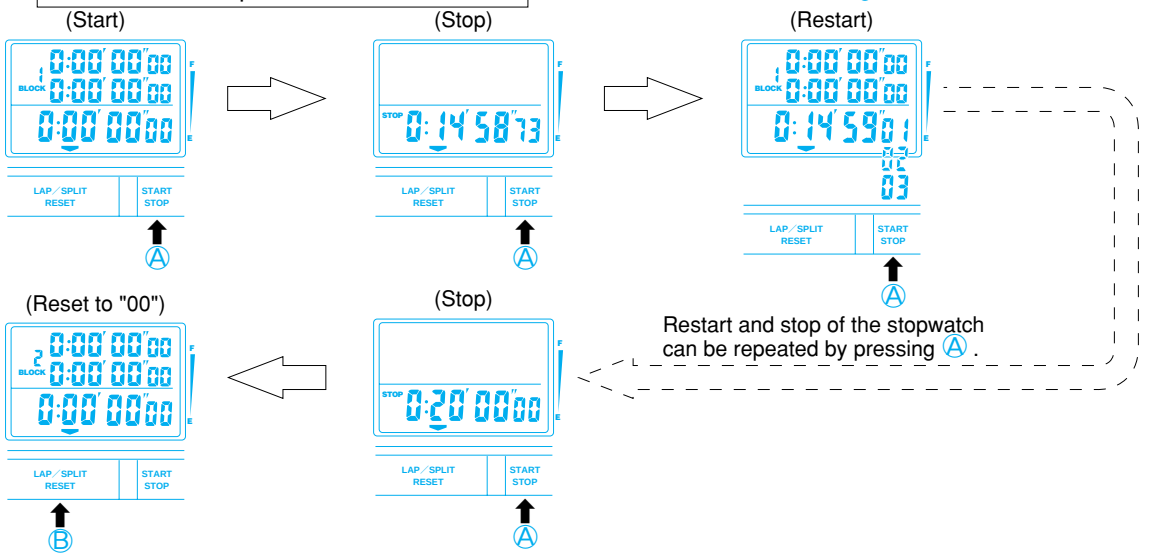
Press the buttons in the following order: Ⓐ→Ⓐ→Ⓑ



The new block number for the next measurement is displayed with the digits reset to "00".

Accumulated elapsed time measurement

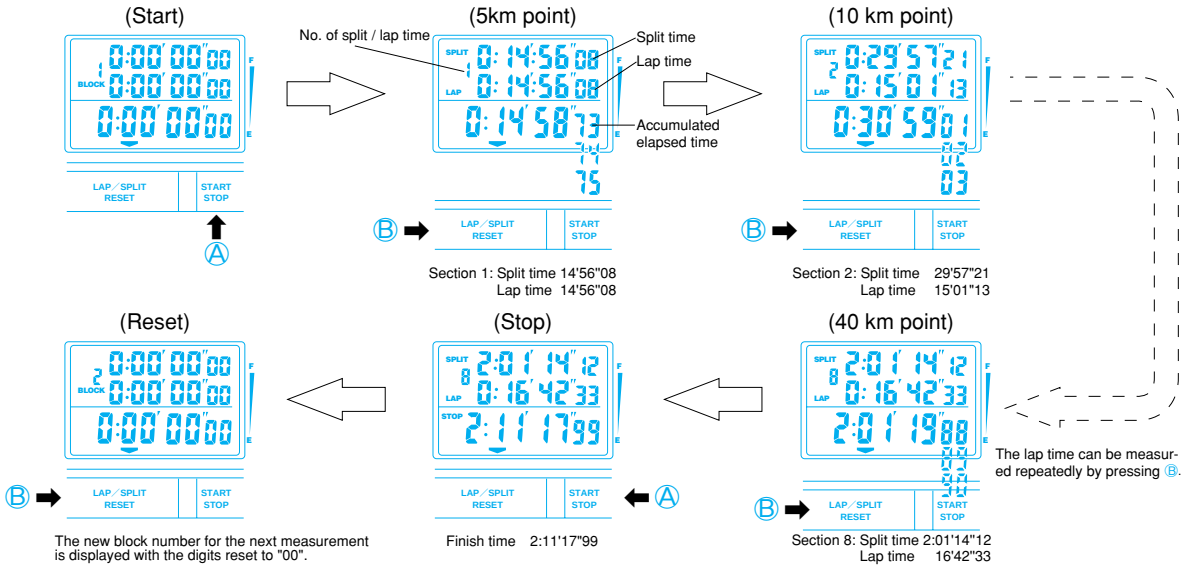
Press the buttons in the following order: Ⓐ→Ⓐ→Ⓐ···→Ⓐ→Ⓑ



The new block number for the next measurement is displayed with the digits reset to "00".

How to measure lap time/split time (When the accumlated elapsed time display of the stopwatch mode is used, for example, in a marathon race)

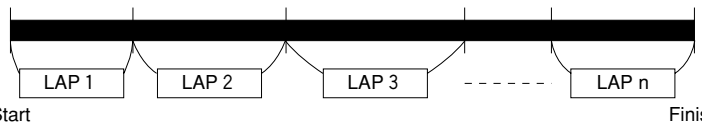
Press the buttons in the following order: Ⓐ→Ⓑ→Ⓑ···Ⓑ→Ⓐ→Ⓑ



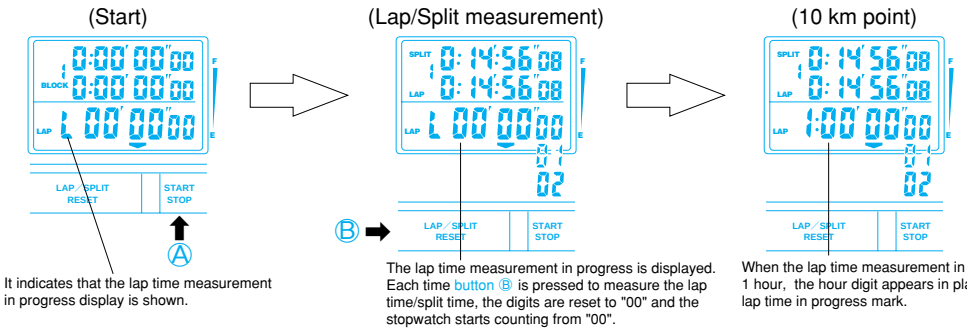
How to measure lap time/split time
(When the lap time measurement in progress mode is used)

Press the bottons in the following order: Ⓐ→Ⓑ→Ⓑ···→Ⓑ→Ⓐ→Ⓑ

Lap time measurement in progress display··· While a lap time is being measured, the measurement in progress is displayed.



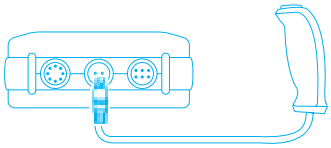
Press mode selection button ① (STOP.W) to show the lap time measurement in progress display of the stopwatch mode.



When the grip switch is used:

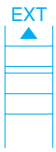
① Changeover to the grip switch

● Connect the grip switch to the stopwatch.



Grip switch

● Slide up the grip switch selector located on the right side of the stopwatch.



⬆ Upper position

＊While the grip switch selector is set at the upper position, button Ⓐ and Ⓑ will not work, and the stopwatch is operated solely by the grip switch.

② Time measurement

● The measurement is started by pressing the grip switch once. Split time and lap time can be measured repeatedly with each press of the grip switch.

(Start) → (With each press of the grip switch, split time and lap time are measured repeatedly.)

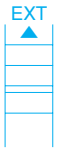
＊By pressing the grip switch, split time and lap time can be measured, but the measurement cannot be stopped. After the final split or lap time is measured, follow the stops in ④ End of measurement" to stop the measurement.

③Printout of lapse of time (Only when in the time/calendar mode and the power switch of the printer is on)

● The stopwatch can printout the time a lap time is measured in the same manner as you press the grip switch in the stopwatch mode.

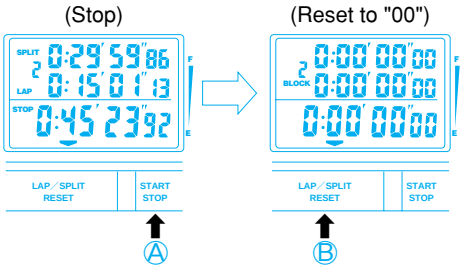
④End of measurement

● After the measurement is over, slide down the grip switch selector.



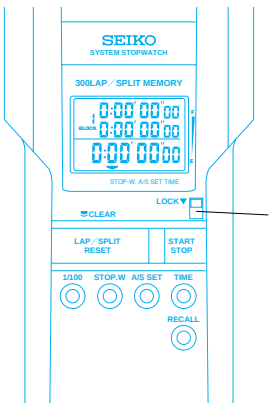
⬇ Lower position

● After sliding down the selector, press button Ⓐ to stop the measurement and then press button Ⓑ to reset the stopwatch.



How to use the lock lever

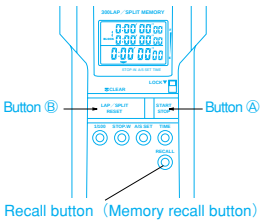
To prevent any mistaken operation of button Ⓐ (start/stop of the stopwatch) during the measurement, it is recommended that button Ⓐ be locked with the lock lever after the measurement is started.



Lock lever
After the measurement is started, slide down the lock lever.

＊While the lock lever is slid down, button Ⓐ (START/STOP) is locked and cannot be pressed.

5 .HOW TO USE THE MEMORY FUNCTION



■The memory recall function

- The data obtained in the measurement can be recalled and displayed.
- Up to 100 blocks of data or 300 data can be stored and recalled.
- Besides being recalled and displayed, the data in memory can also be printed out. (Refer to "6. HOW TO PRINT OUT")
- The stored data is recalled by pressing recall button. The data is recalled successively if the button is kept pressed.
- The stored data can be recalled while the stopwatch is measuring.
- The data can be stored in memory even while printing out the data during the measurement.

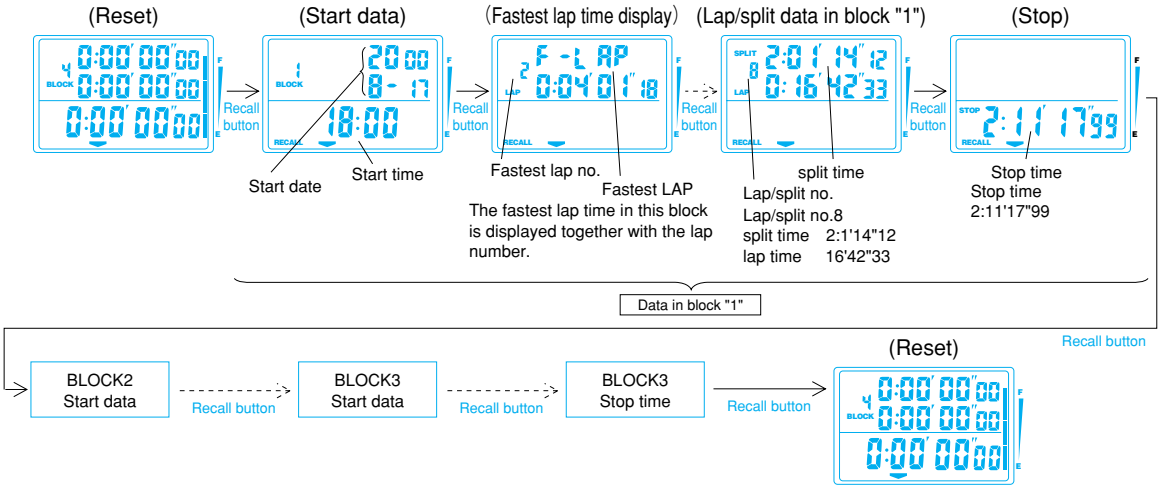
・Order of recalling the stored data

	With each press of recall button
When the stopwatch is stopped	The data is recalled starting from the oldest one.
When the stopwatch is in use	The data is recalled starting from the newest one.

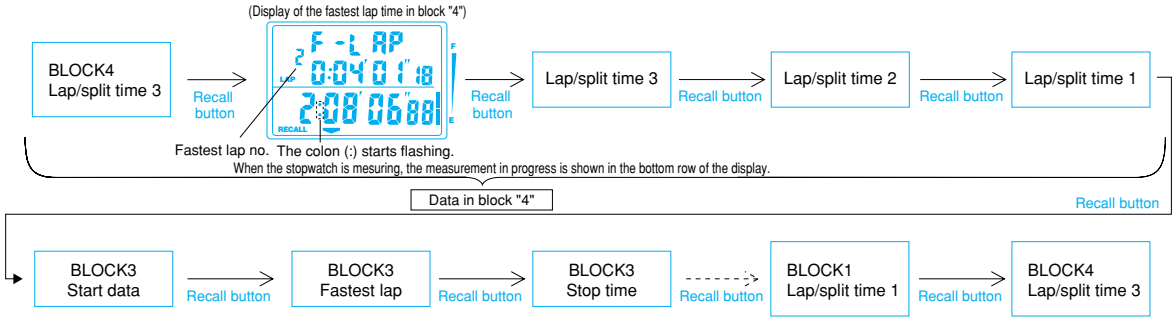
・Button operation while the stored data is recalled

Display before recall	Button Ⓐ	Button Ⓑ	mode selection button ① (STOP.W)
Reset	Returning to the display before recall	Clearing the data in memory	Returning to the display before recall
Stopped	Returning to the display before recall	Returning to the display before recall	Returning to the display before recall
Measuring	Stopping the measurement	Measuring lap/split time	Returning to the display before recall

When the stopwatch is reset or stopped:
The data is recalled starting from the first data in block "1".
<Ex.) When the display is reset to "00" in block "4">



When the stopwatch is measuring:
The data is recalled starting from the newest one.
〈ex.) When the measurement of the third lap / split time in block "4" has been completed.〉



■How to clear the stored data (All clear of data)

・The memory clear function is useful in the following cases.
  a) When the stored data becomes unnecessary.
  b) When the residual memory is not sufficient for a new measurement.

・Once the following steps are taken to clear the data, all the stored data is erased from memory. The stored data cannot be erased one by one or block by block.

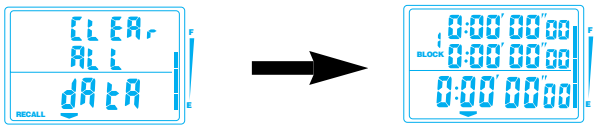
①While the stopwatch is measuring or when the digits are not reset after the end of the measurement, the stored data cannot be erased from memory.
In that case, end the measurement and reset the stopwatch.


(Digits reset to "00")

②Press recall button
In the memory recall display, the stored data can be erased irrespective of which data is displayed.


(Start data)
Recall button

③Keep button Ⓑ pressed for more than 1.5 seconds.
While button Ⓑ is kept pressed, the display below is shown with warning beeps.
After 1.5 seconds, the stored data is erased from memory with a long beep.
All the data is erased from memory and the initial measurement display is shown.
＊Unless button Ⓑ is kept pressed for more than 1.5 seconds, the stored data will not be erased from memory.



Button Ⓑ
(Memory clear procedure)
(Digits reset to "00")

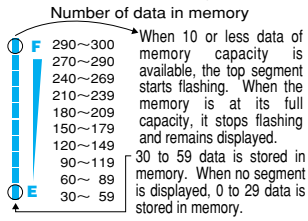
■Notes on memory capacity

- The number of data in memory is shown graphically by the memory capacity indicator.
- Besides the measured lap times/split times, the start time data and block number are also retained in memory as two separate data. Therefore, a block of data includes at least three data. If more than one block is used to store the data, the memory become full even before the number of lap time/split time measurements in memory amounts to 300.

●How to read the memory capacity indicator

The number of data stored in memory is displayed graphically with a 10-segment bar.

Each segment of the bar corresponds to 30 data. The segments are displayed one by one from the bottom to indicate the number of data in memory.



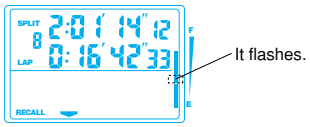
●When the memory reaches its full capacity:

- All the segments of the bar are displayed.
- The 301st data and those measured thereafter will be displayed but will not be stored in memory for later recall.

●Memory data guide during recall

While the data is recalled, a segment of the bar flashes to indicate the measurement order of the data being recalled.

In the illustration below, 210 to 239 data is stored in memory and the data being recalled is between 120th and 149th data in memory.



6 .HOW TO PRINT OUT

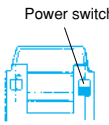
1.How to set the paper in the printer

●Besides the thermal paper S950 included with this model, the thermal paper S951 is available for printing out the stored data. It is a long-type thermal paper that can print out up to 2,800 lines, and sold for ¥578. To use S951, the paper holder SVAZ007 for exclusive use with it is necessary. It is sold separately for ¥3,990.

1 Cut the first pasted position of the paper straight.

2 Open the paper cover as shown in the illustration.

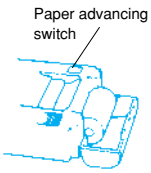
3 Slide the power switch to "ON". At this time, the motor runs for approximately 1 second to indicate that the power is supplied.



4 Inset the end of the paper into the paper insertion slot.

(Be sure to set the paper with the right side up. It can only be printed on one side.)

5 Keep the paper advancing switch pressed until the end of the paper is advanced out 2 to 3 cm from the printer.
(Do not pull out the paper by force.)



6 Put the roll paper into the holder and close the paper cover.

(If the roll paper gets out of shape, make it round before inserting it into the holder.)

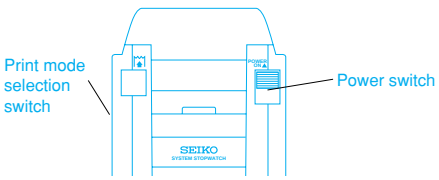
Notes 1 Do not pull the paper in the reverse direction (opposite to the direction of advancing the paper), as this will damage the printer. When replacing the remaining roll paper with a new one, first cut the paper in the holder, then remove the rest of it by pressing the paper advancing switch, or pull it out in the direction of advancing the paper.

2 Be sure to use the roll paper S-950 for exclusive use with this model. Otherwise, poor printing or malfunction will be caused.

2 .Printout

Printout during the measurement

1 Turn on the power switch for printer before starting the measurement. When the switch is turned on, the roll paper is advanced by one line.



2 Operate print mode selection switch to select the printout from "lap time only" and "both split time and lap time".

Both split time and lap time are printed out.

(print mode selection switch)

Only split time is printed out.

3 After the measurement is started, the identification number (if it is set), block number, starting time, date, month and year are printed out, and then the time data are printed out successively as soon as they are measured.

Print mode selection switch

LAP
SPLIT
SPLIT
Split time only

LAP
SPLIT
SPLIT
Both split time and lap time

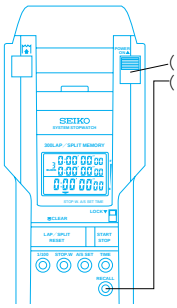
Example of printout

Block number	BLOCK:1
Year･Month･Date	1999 10 10
Start time	START 10:19
	SPLIT
Split time	1-0:05′ 03 76
	2-0:05′ 12 33
	3-0:05′ 41 13
	4-0:05′ 59 06
	5-0:06′ 17 88
	6-0:06′ 43 56
	7-0:07′ 21 47
	8-0:07′ 36 48
Finish time	/S/0:08′ 02 58

Block number	BLOCK:1
Year･Month･Date	1999 10 10
Start time	START 10:19
	SPLIT/LAP
Split time Lap time	1-0:18′ 05 33
	0:18′ 05 33
	2-0:36′ 37 78
	0:18′ 32 45
	3-0:55′ 13 11
	0:18′ 35 33
	4-1:13′ 25 31
	0:18′ 12 23
	5-1:31′ 57 55
	0:18′ 32 21
	6-1:49′ 32 78
	0:17′ 35 23
	7-2:01′ 31 04
	0:17′ 58 26
	8-2:25′ 43 62
	0:18′ 12 58
Finish time	/S/2:54′ 02 77

＊When the power switch of the printer is turned on after the measurement is started, the data is printed out starting from the next measurement data.

Printout after the measurement



(1) Turn on the power switch.
(2) Press memory recall button (RECALL).
⇩
The time data stored in memory are printed out.

＊When all the stored data are printed out, the printer automatically stops.

- The stored data can be printed out as many times as necessary.
- Printout can be selected from only the desired block of data and all the blocks of data.

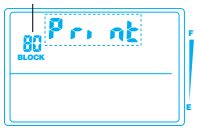
"Printout of the desired block of data"

① Memory recall
Show the memory recall display, and select the block of data you wish to print out.

(Start data)
Recall button

②Turn on the power switch of the printer.
③Keep recall button pressed.
When the stopwatch confirms the "Power on" of the printer, flashing "Print" is displayed.

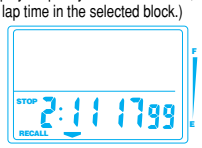
Block No. for the block of data to be printed



(Printout display for desired block of data)
Recall button

- If recall button is released immediately after flashing "Print" is displayed, the printout will be canceled and the display returns to the memory recall display.

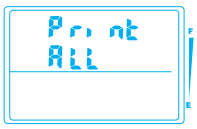
④ Keep recall button pressed for 1 second, and then release it as "Print" stops flashing and remains displayed.
The data in the selected block is displayed quickly one after another, and then printout is started.
(While the data in the block is displayed quickly one after another, the stopwatch checks for the fastest lap time in the selected block.)



The total elapsed time of the block is displayed.

"To print out the data in all the blocks in memory"
①Turn on the power switch of the printer.
②Show the memory recall display, and keep recall button pressed. Flashing "Print" is displayed.
③Printout of all the blocks of data
- Keep recall button pressed further until "Print All" is displayed.

④Then, release recall button. The data in all the blocks is displayed quickly one after another starting from Block "1", and will be printed out at a stretch.
(While the data is displayed quickly one after another, the stopwatch checks for the fastest lap time in each block.)



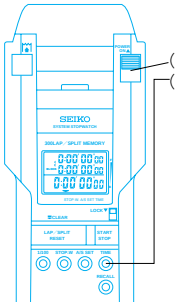
(Printout of all the blocks of data)
Recall button

Notes:
＊While the printout is under way, none of the stopwatch buttons will work.
- Once started, the printout cannot be canceled halfway.
- Even if the power switch of the printer is turned off while the printout is in progress, the button operation of the stopwatch is nullified until entire data to be printed is shown on the display.

Printout of lapse of time

- In addition to the elapsed time, the stopwatch can print out the time when the lap time is measured.
- The time a lap time is measured is not stored in memory.

1 Turn on the power switch for printer and then press mode selection button②(TIME) to set the stopwatch to the time/calendar mode.

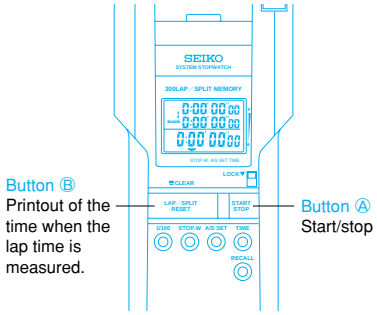


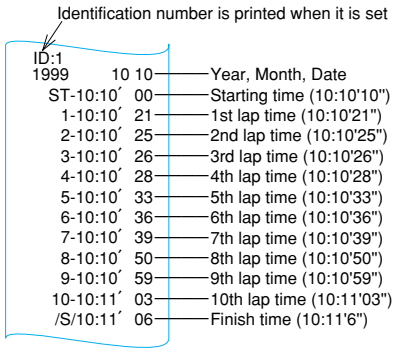
(1) Turn on the power switch.
(2) Press mode selection button ③ (TIME) to set the stopwatch to the time/calendar mode.

＊Please note that the time of measurement cannot be printed out unless the stopwatch is reset to "00".

Stopwatch mode	⇨	Time/calendar mode
		

2 Press button Ⓐ to start the printout. With each press of button Ⓑ, the time when the lap time is measured is printed out. To stop the printout, press button Ⓐ





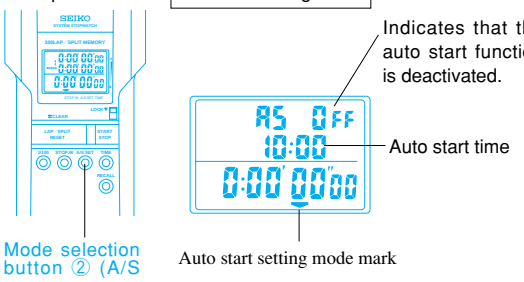
＊The time is printed out in the 24-hour indication.

7 .HOW TO USE THE AUTO START FUNCTION

Auto start function: By presetting the time when the measurement is started, the stopwatch automatically starts measuring at the designated time. This function is very convenient for a competition like marathon, where the race starts at a fixed time. In addition, the designated starting time can be transferred to other stopwatches such as Cal. S143, S123, S124 and thus the measurement can be started simultaneously at different checkpoints.

1 .Auto start time setting (how to set the starting time)

1 Press the mode selection button ② (A/S SET) to set the stopwatch to the auto start setting mode.



2 Set the auto start time.

Minute setting

Press button Ⓑ, and the minute digits start flashing. Press button Ⓐ to set the digits. With each press of the button, one minute is advanced.

Hour setting

Press button Ⓑ, and the hour digits start flashing. Press button Ⓐ to set the digits. With each press of the button, one hour is advanced.

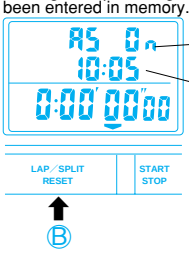
＊The digits move quickly if the button is kept pressed.

NOTES:When you press button Ⓑ to start setting the auto start time, all the stored data is cleared.

3 Enter the auto start time.

Setting

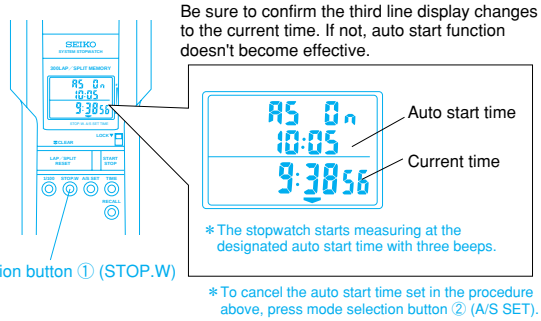
After setting the auto start time, press button Ⓑ again. The digits stop flashing and the auto start time set has been entered in memory.



4 After the auto start time is entered in memory, press button ① (STOP. W) to return to the stopwatch mode.

Return to the stopwatch mode.

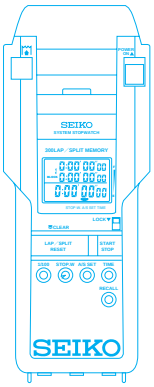
Be sure to confirm the third line display changes to the current time. If not, auto start function doesn't become effective.



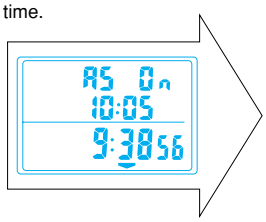
＊The stopwatch starts measuring at the designated auto start time with three beeps.

＊To cancel the auto start time set in the procedure above, press mode selection button ② (A/S SET).

2 .Transfer of the designated auto start time to other stopwatch (Cal. S143, S123, S124)

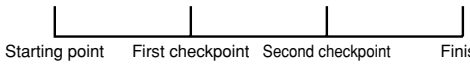


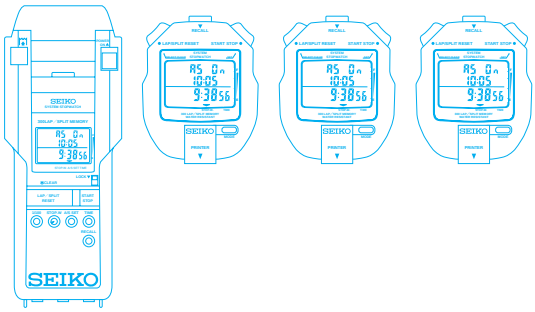
By transferring the designated auto start time to stopwatches Cal. S143, they can start the measurement at the same time.



(Ex.) The stopwatch Cal. S149 and the three stopwatches Cal. S143 will start measuring simultaneously at 10:05.

(EX.) Marathon race

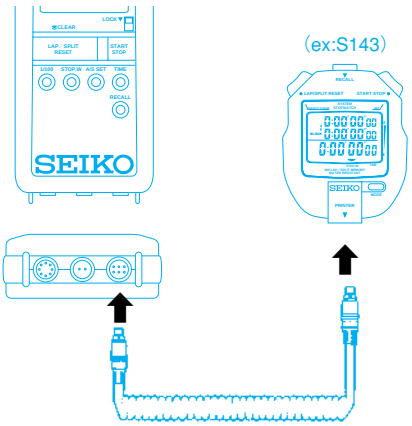




＊The four stopwatches automatically start measuring simultaneously at a designated time, and therefore, there is no need to adjust the time of each stopwatch.

How to transfer the auto start time

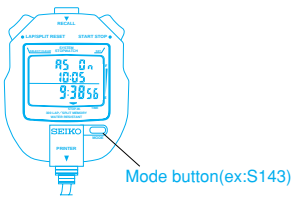
1 Inset the transfer cord into the jack for auto start to connect the stopwatch Cal. S149 to the stopwatches.



2 Press the mode buttons of the stopwatches in stopwatch mode. The auto start time will be automatically transferred to them.

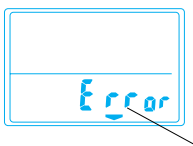
①Reset the stopwatch, and clear all the stored data. If not the auto start time can not be set.

②Press the mode button, the auto start time is transferred.



3 Remarks in transferring the auto start time.

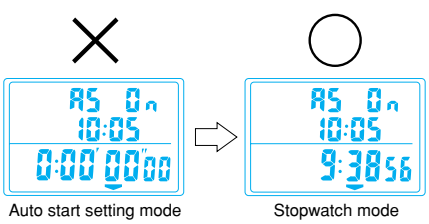
The error display is shown.



If the auto start time is not transferred properly, the error display is shown. In that case, press mode button again.

The auto start time cannot be transferred even if the mode button is pressed.

The designated auto start time will not be transferred to stopwatches if Cal. S149 remains in the auto start setting mode. Return Cal. S149 to the stopwatch mode, and then resume the transfer.

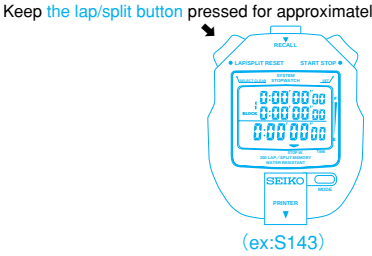


Press mode selection button ① (STOP. W) to return to the stopwatch mode.

Be sure to confirm the third line display changes to the current time. If not, auto start function doesn't become effective.

To stop and resume the auto start

Keep the lap/split button of the stopwatches pressed for approximately 2 seconds. The auto start function will be deactivated.



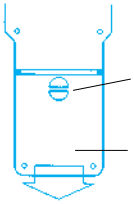
8 .HOW TO INSERT BATTERIES INTO THE PRINTER

Use four SUM-3 (R6P) dry batteries.

1 Slide the power switch to "OFF" and then remove the battery hatch.

2 Inset the batteries into the battery compartment as shown in the illustration below, checking that the (+) and (-) terminals are properly set.

3 Close the battery hatch.



Put the hatch toward you while pushing the portion indicated by the arrow.

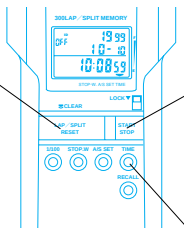
battery hatch

Slide the battery hatch along the grooves of the battery compartment.

9 .TIME • CALENDAR SETTING

Caution ! Time/calendar setting and identification number setting can be made only when the stopwatch is reset.

1 .Press mode selection button ③(TIME) to set the time to the Time/calendar mode.

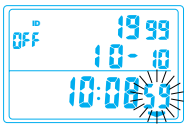


Button Ⓑ
Selection of the digits to be adjusted.

Button Ⓐ
Setting the digits to be adjusted.
(The digits can be advanced quickly by keeping the button pressed.)

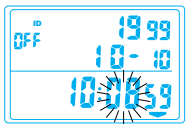
Mode select ion button ③ (TIME)

2 . Seconds setting



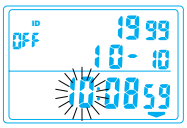
1 Press Ⓑ and the second digits will flash.
2 Press Ⓐ in accordance with a time signal to reset the second digits to "00".
＊When the second digits count any number from "30" to "59" and Ⓐ is pressed, one minute is added and the second digits are reset to "00".

Minutes setting



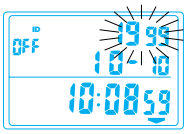
1 Press Ⓑ and the minute digits will flash.
2 With each press of Ⓐ, one minute is advanced.

Hour setting



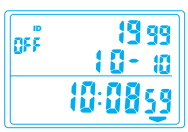
1 Press Ⓑ and the hour digits will flash.
2 With each press of Ⓐ, one hour is advanced.

Year setting



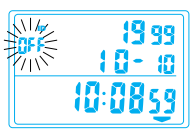
1 Press Ⓑ and the year digits will flash.
2 With each press of Ⓐ, one year is advanced.

Finish of time/calendar setting



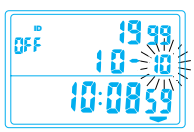
1 After all the adjustment are completed, press Ⓑ.

ID setting



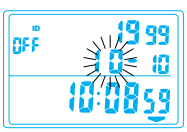
1 When button Ⓑ is pressed, the identification number digits start flashing.
2 With each press of button Ⓐ, one digit is advanced. "OFF" means that no identification number is set.

Date setting



1 Press Ⓑ and the date digits will flash.
2 With each press of Ⓐ, one day is advanced.

Month setting

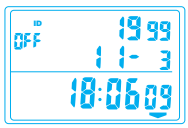


1 Press Ⓑ and the month digits will flash.
2 With each press of Ⓐ, one month is advanced.

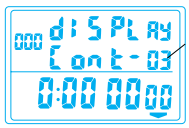
3 .Adjustment of the contrast on the display

・The contrast of the display can be adjusted.

①Show the time/calendar mode.



②Press recall button to show the contrast adjustment display.
The contrast can be adjusted for 10 levels from level "1" to "10".
The display is the lightest at level "1" and the darkest at level "10".



Contrast adjustment display
Button Ⓐ: Increasing the level (darker)
Button Ⓑ: Decreasing the level (lighter)

③Press recall button again to return to the time/calendar mode.

10.PRECAUTIONS

（1） When the power switch of the printer is turned on during the measurement, the data measured thereafter will be printed out.

（2） While the printer is printing out, do not pull out the roll paper or do not pull it back. Also, do not operate the stopwatch without installing the roll paper on the printer, as this will cause a malfunction of the printer.

（3） When the printer is not used, be sure to turn the power switch of the printer "OFF".

（4） The optional parts (such as grip switch) is not used, besure to put the cap on the jack.

Remarks on roll paper (thermal paper)

Since this model is a thermal printer, which prints on thermal paper by heating it, it is not necessary to replace the ink. Be sure to observe the following.

●To preserve new thermal paper, put it in a box to avoid direct light and keep it in a dry cool place.

●Do not touch the printing surface of the thermal paper, as the sweat or oil on the palm will cause poor printing.

●Besides the thermal paper S950 included with the printer, the thermal paper S951 is available for printing out the stored data. It is a long-type thermal paper that can print out up to 2,800 lines, and sold for ¥578 (include Tax). To use S951, the paper holder SVAZ007 for exclusive use with it is necessary. It is sold separately for ¥3,990 (include Tax).

●To preserve the printed thermal paper, be sure to observe the following.

[1] Do not expose thermal paper to bright light for a long time. Printed digits or letters may be faded.

＊Be sure to use the roll paper S-950 or S-951 for exclusive use with this model. Otherwise, detective printing or damage of the printer will be caused.

[2] Keep the thermal paper away from high temperature, high humidity, or direct sunlight. The roll paper may be discolored.

[3] In case the printed paper are kept attached on a pasteboard, etc., do not use the paste or adhesives containing volatile organic solvent. Also, do not use cellophane adhesive tape. The thermal paper may be discolored. It is recommended that the starch or synthetic paste be used.

[4] Do not place the thermal paper near the copies reproduced by the copier using ammonia. The thermal paper may be discolored.

[5] Do not leave the thermal paper in contact with vinyl chloride films for a long time. It may be discolored, or the printed digits or letters may be faded.

⚠ CAUTION

・Your watch is not water-resistant, be careful not to get it wet with water.

⚠ CAUTION

・If your watch is of the fob or pendant type, the strap or chain attached to the watch may damage your clothes, or injure the hand, neck, or other parts of your body.

PLACES TO KEEP YOUR WATCH

・If the watch is left in a temperature below -10℃ or above +60℃ for a long time it may function improperly or stop operating.

＊This watch is so adjusted that it will maintain stable time accuracy in normal temperatures.(5℃～35℃)
It will lose or gain slightly, but it will regain high time accuracy when it returns to normal temperature.

・Do not leave the watch in a place where it is subjected to strong magnetism or static electricity.

・Do not leave the watch where there is strong vibration.

・Do not leave the watch in a dusty place.

・Do not expose the watch to gases or chemicals.
(Ex.: Organic solvents such as benzine and thinner, gasoline, nail polish, cosmetic spray, detergent, adhesives, mercury, and iodine antiseptic solution.)

・Do not leave the watch in a hot spring, or do not keep it in a drawer having insecticides inside.

11.REMARKS ON THE BATTERIES

（1） Battery life
When a new normal battery is installed, the stopwatch will operate approximately 3 years.
＊If the stopwatch is used for more than 3 hours a day, the battery life may be less than 3 years.
●When four new and normal SUM-3 manganese dry batteries are installed, the printer can print approximately 10,000 lines (approx. 14 rolls of paper) if it continuously operates at 24℃. When alkaline manganese batteries are used, it can print approximately 20,000 lines (approx. 28 rolls).
＊It the printer is used at extremely low temperatures, the battery power becomes weak, and it cannot print as many lines as it prints at normal temperature range. It is recommended, therefore, that alkaline manganese batteries be used at such low temperatures.
●When the following conditions occur with the power switch set at "ON", replace the batteries with new ones.
(1)Printing speed has reduced.
(2)Printed digits or letters are uneven or incomplete.
(3)The digits or letters are too lightly printed.
(4)The paper is not advanced at all or advanced irregularly.
(5)The printer will not print at all.
If the above conditions occur, replace the batteries with new ones as soon as possible foltowing the procedure in "8 How to insert the batteries into the printer"

（2） Monitor battery
The battery in your watch may run down in less than the specified period after the date of purchase, as it is a monitor battery which is inserted at the factory to check the function and performance of the watch.

（3） Battery change
①For battery replacement, be sure to have the battery replaced with a new one at the retailer from whom the watch was purchased or at an authorized SEIKO DEALER, and request the battery for exclusive use with the SEIKO watches.
②If the old battery is left in the watch for a long time, a malfunction may be caused due to battery leakage, etc. Have it replaced with a new one as soon as possible.
③Battery replacement is charged even if it runs down within the guarantee period.
④Once the case back is opened for battery replacement or other purposes, the original water resistant quality designed for the watch may deteriorate when it is closed. When you have the battery replaced with a new one, also request the water resistance test pertaining to the water resistant quality of your wtach. If your watch has 10-bar or higher water resistant quality, be sure to have such test performed on the watch every time the battery is replaced.

（4） Battery life indicator (stopwatch)
When the battery nears its end, flashing battery mark "BATT" is displayed. In that case, have the battery replaced with a new one as soon as possible by the retailer from whom your stopwatch was purchased or an AUTHORIZED SEIKO DEALER. When the battery is replaced with a new one, all the stored data will be erased from memory. Before battery replacement, therefore, print out the data you wish to keep.

⚠ WARNING

1.Do not remove the battery from the watch.
2.If it is necessary to take out the battery, keep it out of the reach of children.
3.If the child swallows it, consult a doctor immediately as it will adversely affect the health of the child.

⚠ CAUTION

1.Never short-circuit, tamper with or heat the battery, or never expose it to fire as it may explode, generate and intense heat or catch fire.
2.The battery in your watch is not rechargeable. Never attempt to recharge it, as this may cause battery leakage or damage to the battery.
3.If the watch is left in a temperature below +5℃ or above +35℃ for a long time, the battery leakage may result, causing the battery life to be shortened.

12.REPLACEMENT OF THE LIQUID CRYSTAL PANEL

The normal life expectancy for the luquid crystal panel of the watch is approximately 7 years. After that, it may decrease in contrast, becoming difficult to read. Please contact the retailer from whom the watch was purchased to have the liquid crystal panel replaced with a new one.
It will be made at cost.

13.CARE OF YOUR WATCH

●PERIODIC CHECK
・We suggest that you have your watch checked by the retailer from whom the watch was purchased every 2 or 3 years or when the battery is replaced for oil condition, battery electtolyte leakage or damage due to water or sweat. After checking the watch adjustment and repair may be required.

■REMARKS ON REPLACEMENT PARTS

・SEIKO makes it policy to usually keep a stock of spare parts for its watches for 7 years. In princlple, your watch can be reconditioned within this period if used normally. (Replacement parts are those which are essential to maintaining the functional integrity of the watch.)
・The number of years that a watch is considered repairable may vary greatly depending on the conditions under which it was used, and normal accuracy may not be achieved in some cases. We recommend, therefore, that you consult the retailer from whom the watch was purchased when having them repair your watch.
・The case, dial, hands glass and bracelet, or parts there of may be replaced with substitutes if the orginals are not available.

■REMARKS ON AFTER-SALES SERVICING

・If the watch requires service, take it to the retailer from whom the watch was purchased, if the trouble occurs within the guarantee perlod, submit the cerificate of guarantee together with the watch.
・For repair after the guarantee period or for any other information regarding the watch, contact the retaller from whom the watch was purchased or the "CUSTOMER SERVICE DEPARTMENT"of SEIKO CORPORATION or the "SEIKO SERVICE CENTER CO. LTD."
・Guarantee coverage is spelled out in certificate of guarantee. Please read it carefully and keep the certificate for ready reference.

14.TROUBLESHOOTING GUIDE

Before requesting service, please check your stopwatch following the table below.

Problem	Possible cause	Solution
The motor does not run even if the power switch of the printer is turned "ON".	●Weak batteries. ●The batteries are not installed properly. ●The paper is stuck.	●Replace the batteries with new ones. ●Install the batteries properly. ●Remove the paper.
The paper is not advanced by pressing the paper advancing switch.	●Weak batteries. ●The paper is stuck. ●The roll paper gets out of shape.	●Replace the batteries with new ones. ●Remove the paper. ●Make the roll paper round.
By pressing the start button, the paper is advanced, but the printed digits or letters are detective or the data are not printed at all.	●The cord is not connected properly. ●Water or foreign matters are sticking to the cord plug. ●The paper is not set properly.	●Connect the cord correctly. ●Wipe off the water or foreign matters. ●Inset the paper properly.
By pressing the start button, the data are printed out, but the paper is not advanced irregularly.	●The paper is stuck. ●Weak batteries.	●Remove the paper. ●Replace the batteries with new ones.
By pressing the start button, no data are printed out and the paper is not advanced at all.	●Weak batteries. ●The batteries are not installed properly. ●The power switch of the printer is not set to "ON".	●Replace the batteries with new ones. ●Insert the batteries correctly. ●Turn the power switch "ON", and then press the start button.
Auto start time is not transferred.	●The cord is not connected properly. ●Water or foreign matters are sticking to the cord plug.	●Connect the cord properly. ●Wipe off water or foreign matters.

＊For the solution of trouble other than the above, contact the retailer from whom the watch was purchased.

15.SPECIFICATIONS

(Stopwatch)

1 .Frequency of crystal oscillator ····· 32,768Hz (Hz＝Hertz…Cycles per second)

2 .Loss/gain (monthly rate) ····· Less than 15 seconds at normal temperature range (5℃～35℃)

3 .Operational temperature range. ····· −10℃～＋60℃

Desirable temperature range of use ····· 0 ℃～＋50℃

4 .Display system ····· Stopwatch display Measures up to 10 hours. Hour, minutes, seconds, 1/100 seconds, tnree-row display of split time/lap time/total elapsed time or lap time in prooress. No. of blocks, no. of split times (0～999), 300 memory recall, BLOCK, SPLIT, LAP, STOP, RECALL, stopwatch marks, memory indicator, BATT.
Time/calendar display Hour (24hour indication), minutes, seconds, year, month, date and calendar mark, ID no. (OFF/01～99), contrast adjustment display.
Auto start set display AS, OFF, ON, hour, minutes, seconds, 1/100 seconds, auto start set mark.

5 .Display medium ····· Nematic Liquid Crystal, FEM (Field Effect Mode)

6 .Battery ····· Lithium battery SB-T74, 1 piece

7 .Battery Life ····· A new normal battery will last approximately three years.

＊If the stopwatch is used for more than 3 hours a day, the battery life may be less than 3 years.

8 .IC (Integrated Circuit) ····· C-MOS-LSI, 1 piece

9 .Battery life indicator ····· "BATT" mark start flashing when the battery life nears its end.

(Printer)

1 .Printer ····· Model: MTP102
Printing system: Thermal serial dot printing system
Printing method: One-way printing (from left to right)
Printing speed: Approx. 1.5 lines/sec. (DC 5 0V. at 25℃)
Number of digits printed: 13 digits/line (including space)

2 .Recording paper ····· Roll paper S-950
38mm (width) (＋0～0.5mm), overall length 2,400 mm or more (approx. 700 lines can be printed per roll.)

3 .Power supply ····· DC 6.0V (SUM-3 or AM3 dry battery, 4 pieces)
With power switch turned "ON" (No printing) : Approx. 0.02W (DC 6.0V)

4 .Power consumption ····· During printing: Approx. 1.5W (DC 6.0V)

5 .Battery life ····· Manganese battery: Approx. 10,000 lines can be printed. (Equivalent to approx. 14 rolls)
Alkaline manganese battery: Approx. 20,000 lines can be printed. (Equivalent to approx. 28 rolls)

6 .Operational temperature range ····· 0℃～40℃ (The depth of printout does not change even if the temperature changes.)

＊The above specifications are subject to change without prior notice, for product improvement.