SEIKO

SPORTS TIMER

ST－306

INSTRUCTION MANUAL

Many thanks for purchasing SEIKO SPORTS TIMER ST-306.
Before putting your SEIKO SPORTS TIMER, MODEL ST-306, to use, please be sure to carefully read through this manual as it has been designed to provide you with information for correct handling, use and maintenance necessary for safe, long-lasting and trouble-free operation.
Keep this manual at hand for ready reference.

Seiko Time Systems Inc.

-NOTICE-

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(2) This manual may be subject to change without notice.

(3) This manual has been prepared to give complete information necessary for the operation, use, handling and maintenance of SEIKO SPORTS TIMER, MODEL ST-306. For the purpose of our constant technical manual improvement program, your questions, advice, suggestions and comments on the descriptions, illustrations, procedures or any matter concerning this manual are highly appreciated.

(4) SEIKO shall not be liable for any failures of SEIKO SPORTS TIMER, MODEL ST-306 or direct or indirect damages resulting from such failures if such failures are caused: due to abuse, misuse, failure to observe instructions given in the manual and neglect of other reasonable care and servicing due to be done by the owner irrespective of such instructions, and failure due to deliberate actions or gross negligence or accident; or caused by changes, modifications, or alterations made without prior written consent of SEIKO or by any person other than authorized by SEIKO.

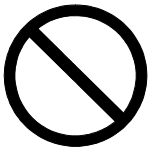
-SYMBOLS AND THEIR MEANINGS-

The following conventions are used in this manual.

⚠ **WARNING**	WARNING is used to indicate the presence of a hazard which CAN cause SEVERE personal injury, death, or substantial property damage if the warning under this heading is ignored.

⚠ **CAUTION**	CAUTION is used to indicate the presence of a hazard which may cause property damage if the warning under this heading is ignored.

The following pictorial symbols indicate what must not be done.



General Prohibition

Prohibition of Disassembly/Tampering

The following pictorial symbols indicate what must be done.

General instructions

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1 SAFETY PRECAUTIONS

The following precautions must be strictly observed for the safety of yourself and your fellow workers and for the protection of property from loss and damages.

	WARNING	
Emergencies	Immediately turn off the POWER switch if you detect abnormalities of the sports timer, such as fuming and burning odors. These abnormal conditions may develop into serious accidents such as fatal electric shock, and fire if left uncorrected. Refer inspection and repair services to your SEIKO dealer or agent.	
Foreign metal pieces	Never put pins, wires, metal pieces or any other foreign objects into a hole or slit in the instrument on purpose or otherwise. If a foreign object is allowed into a hole or slit by mistake, turn off the POWER switch immediately, and call your SEIKO dealer for help. Failure to follow this instruction may lead to a risk of electric shock or fire. Inspection and servicing should be left to the care of your SEIKO agent or dealer.	
Disassembly, repair or modification	Tampering or unauthorized repair or modification of components may adversely affect safety or performance of this instrument. Failure to follow this instruction may lead to a risk of electric shock or fire. Inspection and repair should be left to the care of your SEIKO agent or dealer.	
Installation	Never leave the sports timer outdoors or in a place prone to be exposed to water. Electric leakage may possibly lead to fatal electric shock or fire accident	
	Mount the instrument firmly on a sturdy, level place in a manner that it will not fall over under the influence of wind, vibration or shock. Failure to observe this precaution may result in injury to personnel or damage to the instrument.	
	When installing the sports timer using the stand (ST-20) or car roof rack attachment (ST-21), firmly tighten up the fastening screws. If precariously installed, the instrument may yield and fall under wind pressure, vibration or shock, causing serious injury to personnel or damage to the instrument.	
	When the sports timer is mounted on the stand (ST-20), never use it when the wind is blowing at a velocity of 15m/s or more. Failure to observe this precaution may cause fatal accident and property damage.	
	When the sports timer is mounted on the car roof rack using the attachment (ST-21), limit the car speed to less than 30km/h. Failure to observe this precaution may cause fatal accident and property damage due to fall of the instrument.	
	When installing the team name display unit (ST-24), be sure to engage the round bars into the mating holes and tighten up the thumb nuts firmly. Failure to observe this precaution may cause serious injury to personnel due to fall of the display unit under the influence of wind, vibration or shock.	

	⚠ CAUTION	
Cabling	Handle the cable with care. Never damage or given undue stress to the cable. Nicking the cable sheath, placing heavy objects upon the cable, or straining the cable by undue bending is most prohibitive. Failure to observe this precaution may lead to fatal electric shock or fire accident.	
	Do not use any cable other than specified for exclusive use with the instrument. Failure to observe this precaution may cause cable burnout or instrument failure.	
	Never handle the cable connector with wet hands as such operation can result in fatal electric shock.	
	Be sure to turn off the POWER switch in advance when plugging and unplugging the cable, except in case the sports timer is connected to CT-1000/916 for external synchronization mode operation.	
	STRICTLY OBSERVE THE FOLLOWING PRECAUTIONS. **FAILURE TO OBSERVE THESE PRECAUTIONS MAY LEAD TO EXPLOSION, ELECTROLYTE LEAKAGE, AND EXOTHERMIC REACTION OF DRY CELL, CAUSING INJURIES AND ENVIRONMENTAL POLLUTION.**	
Handling of dry cell	Never use any power supply other than "AA" alkali dry cell (LR6) or manganese dry cell (R6PU).	
	Do not use different types of dry cells together.	
	Do not use old and new dry cells together. When loading the instrument with dry cells for the first time or when replacing spent dry cells, be sure to use a battery of new dry cells.	
	When setting the dry cells into the instrument, do not mistake their plus and negative poles for each other. Place them in the battery hatch oriented as instructed. If the dry cells are set in the wrong directions, instrument failure and other troubles may result.	
	After use, be sure to remove the dry cells from the instrument. If the dry cells are left inside for a long period of time, electrolyte may leak to damage the internal components of the instrument.	

2 FEATURES

(1) SEIKO SPORTS TIMER, MODEL ST-306, is a large-sized digital sports timer full of SEIKO's advanced timing functions. It has 6-digit 200mm-high display modules for clear-cut visibility, can be installed and operated with ease. It weighs only 12.5 kg.
(2) As an upcount timer, it can be used as a timing display system for various sports events including swimming, track races, marathon, walking race, skiing, cycling, soccer, and rugby.
(3) The MODEL ST-306 can also be used for the display of game points and deuce points in tennis.
(4) As a downcount timer, MODEL ST-306 can downcount time to show the remaining time in basketball and other games.
(5) The following three maximum time ranges are available which can be changed over from each other to cover a wide range of sports events:
    a) 99h59m59s
    b) 59m59s9
    c) 59m59s99
    (Note: The fractions of a second are not displayed during counting.)
(6) The MODEL ST-306 can measure lap time, split time and finish time. In addition, it can memorize and re-display either lap or split times for a maximum of 25 athletes. (Ex.: MODEL ST-306 can memorize and display the order of arrivals and finish times for 1st to 25th places.)
(7) The upcount function is available in two modes: one in which the time is counted up from zero, and the other in which the time is counted up from a preset time.
(8) The downcount function has a crossover counting mode in which the time is downcounted from a preset time to zero and in succession upcounted from zero. This mode is suitable for marathon and the like.
(9) The MODEL ST-306 has an auto repeat function in which the time is upcounted and downcounted at fixed intervals to sound a buzzer at a preset time. Accordingly, MODEL ST-306 can be used as a pace-clock..
(10) The MODELST-306 is battery-powered, and can be used both indoors and outdoors. (Note, however, that it cannot be installed outdoors permanently.)
(11) The MODEL ST-306 can be used in combination with a wide variety of SEIKO sports equipment.

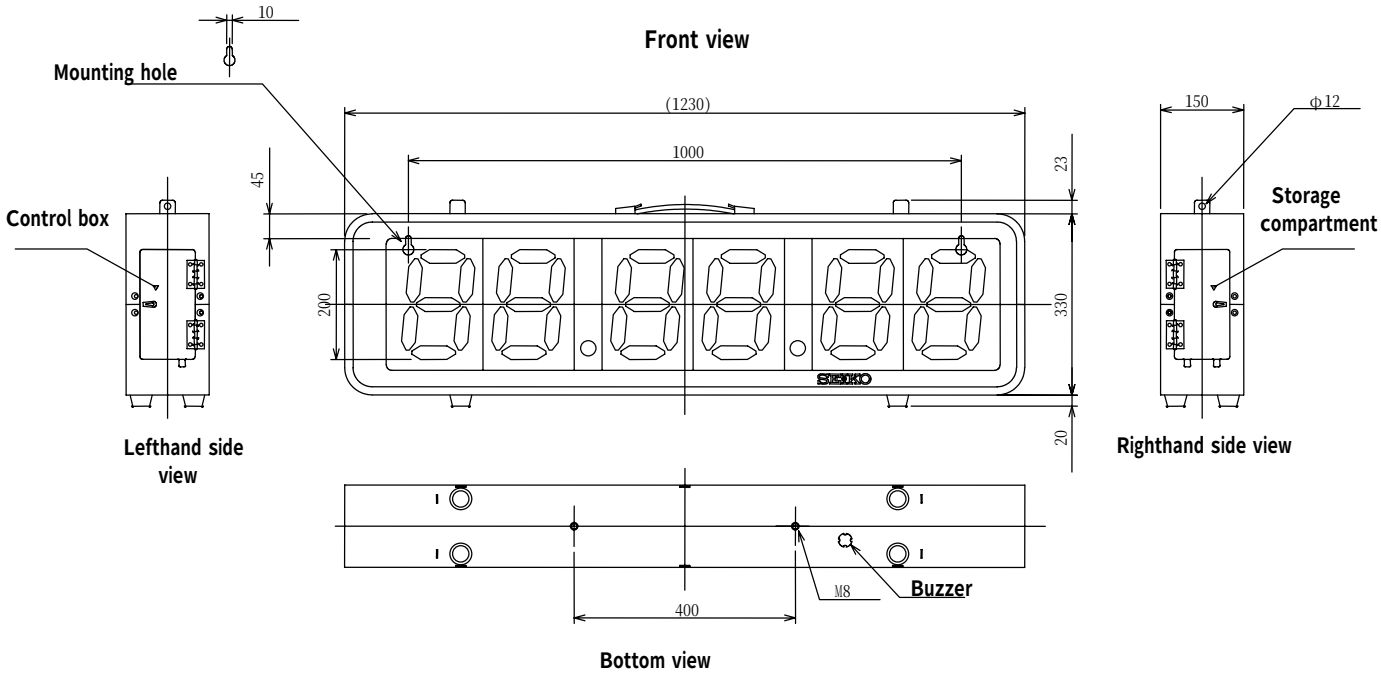
3 PACKING LIST

- Sports timer, Model ST-306
- Grip switch (stored in an exclusive compartment)
- Battery box (stored in an exclusive compartment)
- Manual

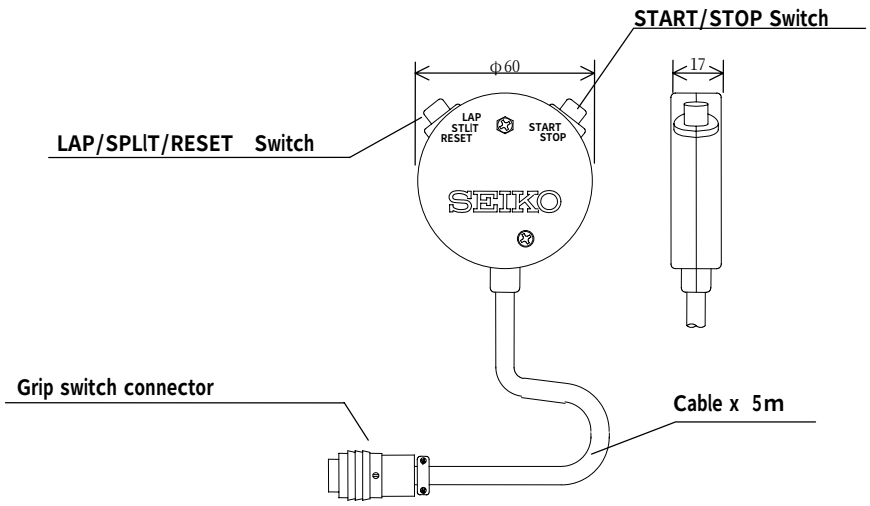
※Check off the above at the time of unpacking inspection

4 NOMENCLATURE AND FUNCTIONS

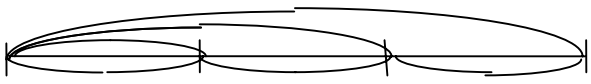
(1) Sports Timer



(2) Grip Switch



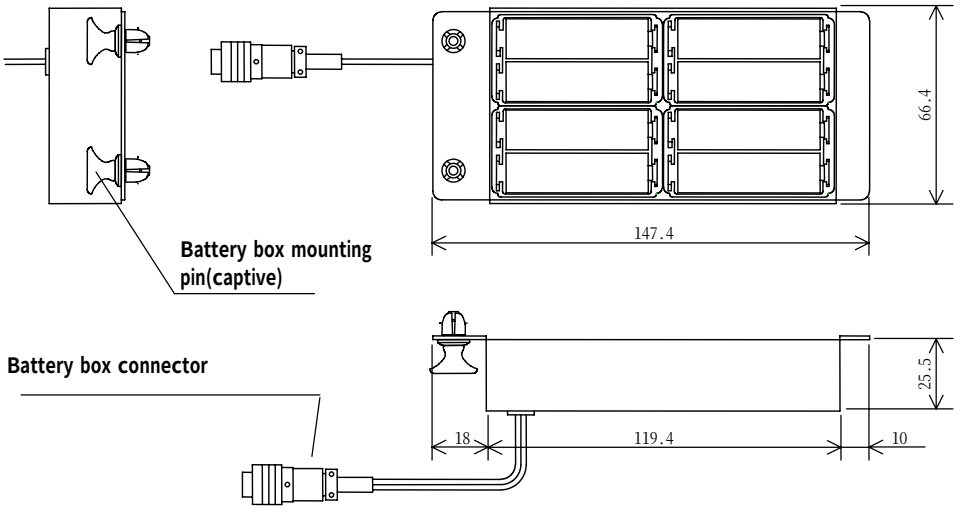
Note: In this manual, the lap time and split time are defined as follows:



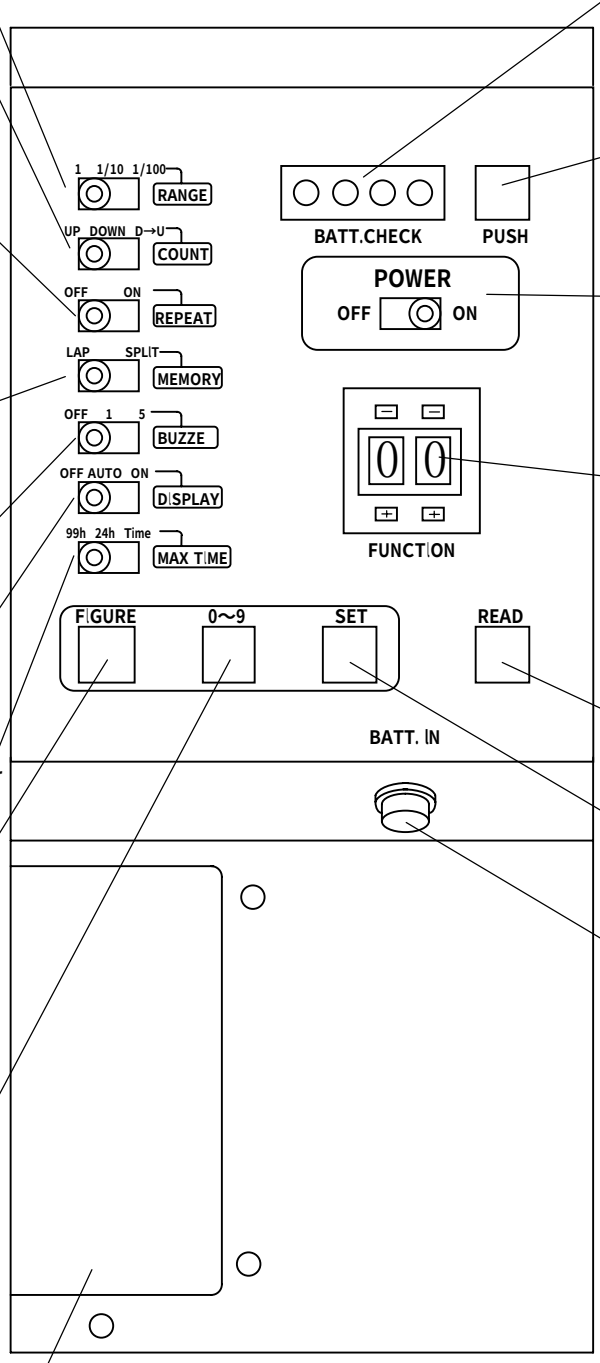
Split time = Time required to cover a distance from the start to a given point. (Time elapsed from the start)

Lap time = Time required to cover a given section of the whole distance. (Interval time)

(3) Battery Box



(4) Control panel (lefthand side panel)



RANGE switch
Used to set the minimum unit of time measurement.

COUNT switch
Used to select the counting mode
(a) upcount mode, b) downcount mode,
(b) c) crossover counting mode (downcount through upcount)

REPEAT switch
To be turned ON when the MODEL ST-306 is used as a cyclic timer in the downcount or upcount mode. When turned ON in the crossover counting mode, the MODEL ST-306 will not stop at the crossover point (zero).

MEMORY switch
Used to select lap or split time for memory. Up to 25 time data sets can be stored (only in the upcount mode).

BUZZER switch
Used to set the beeping duration to 1 sec. or 5 sec. when it is on

DISPLAY switch
Used to select a display operating mode: a) ON, b) OFF, c) AUTO (externally controlled)

MAX TIME switch
Used to set the maximum time for display.

FIGURE switch
Used to shift the place at which to enter a figure. When the FIGURE switch is given a push, "0" will appear in the more lefthand place of the display. At every push of the FIGURE switch, "0" will step rightwards.

0～9 switch
Used to set the time or points. The number at the place selected by the FIGURE switch can be changed incrementally from 0 to 9. When 9 is reached, a push cycles the number back to 0, from which the same incremental process can be repeated.

Battery box compartment
Used to accommodate the battery box.

BATT.CHECK meter
Used to check the level of electric charge remaining in the battery. When the battery is running short, the red lamp alone will light up to prompt you to replace the battery.

PUSH(battery check) switch
When this switch is pressed, the BATT. CHECK meter will be illuminated for 3 seconds

POWER switch
Used to turn on and off the power supply to the MODEL ST-306

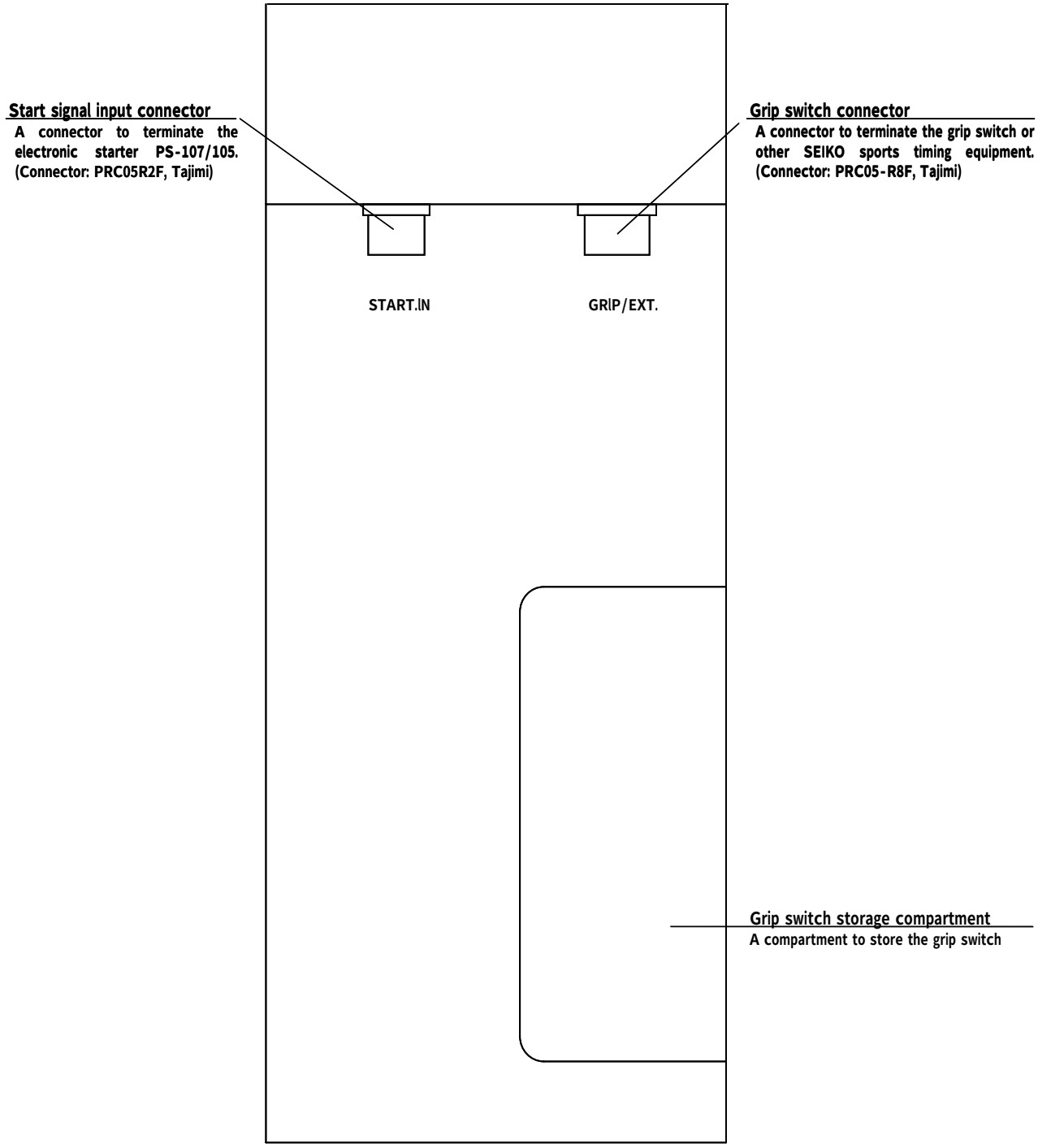
FUNCTION switch
Used to select a function number for a specific application before turning on the POWER switch

READ switch
Used to call forth a maximum of 25 data sets stored

SET switch
When this switch is pressed, the settings are committed to memory.

Battery box connector
A connector used to terminate the battery box or other power supply. (Connector: PRC05-R3M, Tajimi)

(5) Storage panel (righthand side panel)

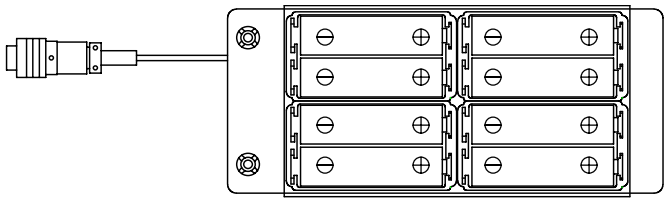


5 PREPARATIONS BEFORE OPERATION

(1) Battery

Set eight "AA" alkali dry cells (LR6) or "AA" manganese dry cells (R6PU) in the battery box.

※The dry cells are not furnished with the MODEL ST-306.



● Battery handling precautions

STRICTLY OBSERVE THE FOLLOWING PRECAUTIONS FAILURE TO OBSERVE THESE PRECAUTIONS MAY LEAD TO EXPLOSION, ELECTROLYTE LEAKAGE, AND EXOTHERMIC REACTION OF DRY CELL, CAUSING INJURIES AND ENVIRONMENTAL POLLUTION.	
⚠ CAUTION	Never use any power supply other than "AA" alkali dry cell (LR6) or manganese dry cell (R6PU).
	Do not use different types of dry cells together
	Do not use old and new dry cells together. When loading the instrument with dry cells for the first time or when replacing spent dry cells, be sure to use a battery of new dry cells.
	When setting the dry cells into the instrument, do not mistake their plus and negative poles for each other. Place them in the battery hatch oriented as instructed. If the dry cells are set in the wrong directions, instrument failure and other troubles may result.

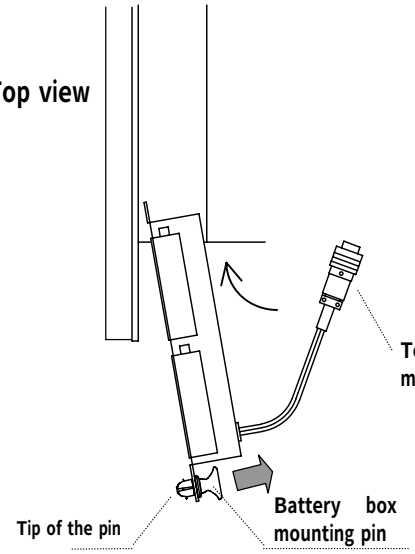
(2)Battery box connection

[Installation of battery box]

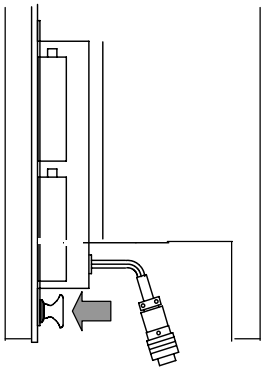
1) Pull the mounting pins in the arrow direction in advance, and insert the battery box into the back as illustrated to the proper position.

NOTE:	The installation of the battery box must be done prior to connecting the battery box connector to the BATT.IN connector of the MODEL ST-306. This is to prevent the battery box connector cable from being damaged by strains.

1) Top view

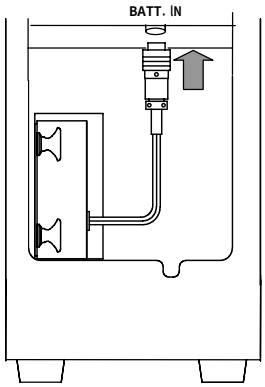


Top View



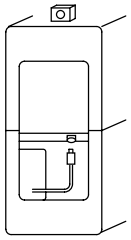
2) Press the battery box mounting pins in the arrow direction until it clicks into position. Make sure that the battery box is fastened firmly to the MODEL ST-306.

Lefthand side view

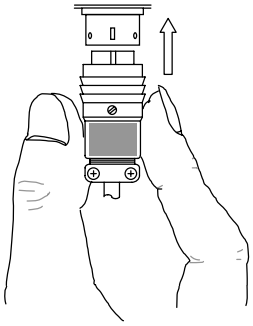


3) Finally, insert the battery box connector into the BATT.IN connector on the MODEL ST-306.

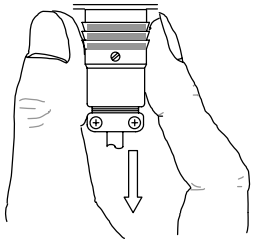
Lefthand side



CONNECTION:
Hold the connector as illustrated, align the groove with the guide key, and insert straight until clicked into position.



DISCONNECTION:
Hold and pull the connector out as illustrated.



[How to remove the battery box]

First diconnect the battery box connector from the BATT.IN connector of the MODEL ST-306. Give a light pull to the battery box mounting pins to disengage the battery box from MODEL ST-306, and pull out the battery box toward you.

(For removal, follow just the reverse of the mounting steps 1), 2) and 3).)

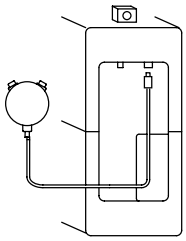
CAUTION: Do not pull the battery box mounting pins excessively. They may come off from the battery box.

(3) Connection of grip switch

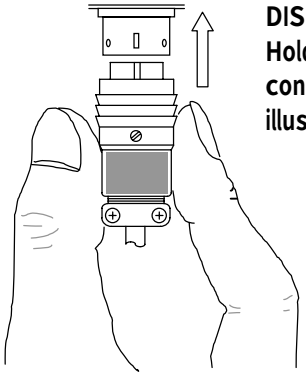
(The procedure is the same as for the connection of battery box connector.)

Take out the grip switch from the storage compartment, and connect it to the GRIP/EXT. connector.

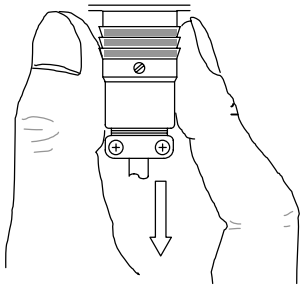
Righthand side



CONNECTION:
Hold the connector as illustrated, align the groove with the guide key, and insert straight until clicked into position.



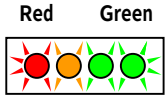
DISCONNECTION:
Hold and pull the connector out as illustrated.



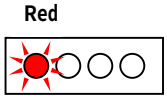
(4) Checkup of battery voltage

Turn ON the **[POWER]** switch (on the control panel), and push the **BATT.CHECK** box to read the battery check meter.

*If the red lamp alone lights up, the battery must be replaced immediately because the MODEL ST-306 will not work properly. (Under such condition, the display may fail to drive the display elements properly.)



(OK)



(To be replaced)

⚠ CAUTION	When replacing the dry cells, strictly observe the precautions instructed under the heading, "BATTERY HANDLING PRECAUTIONS". Failure to observe the precautions may lead to serious injuries and environmental pollution

(5) Self-check operation

Check all display digits before operation as follows.

Set FUNCTION to "00".

Hold down the 0-9 switch and [SET] switch simultaneously for more than 3 seconds.

Release the switches as soon as the self-check sequence starts.

The self-check sequence is run for one cycle only. To repeat the cycle, hold down the 0-9 switch and [SET] switch simultaneously for more than 3 seconds again.

[Display sequence]

Black

0

1

.

.

.

Black

As soon as the display is turned black, the buzzer will sound for about 5 seconds

(6) Measurement and display range

RANGE switch setting (minimum indicating unit)	Maximum display time	Remarks
1s	99h59m59s	In case MAX TIME is 99h
1/10s	59m59s9	During counting, the fractions of a second are blacked out.
1/100s	59m59s99	

NOTE: When the MODEL ST-306 is operated on an external display signal, its time display will follow the RANGE switch setting.

6 INSTALLATION OF SPORTS TIMER

(1) Standard installation

In installing the MODEL ST-306, follow the instruction below.

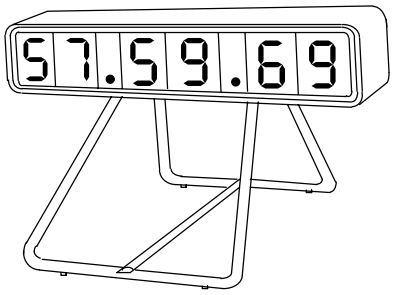
⚠ WARNING	Mount the MODEL ST-306 firmly on a sturdy, level place in a manner that it will not fall over under the influence of wind, vibration or shock. Failure to observe this precaution may result in injury to personnel or damage to the instrument	❗

(2) Installation using optional attachments

(a) Stand (ST-20)

This stand is used to mount the sports timer, MODEL ST-306.

Fasten the MODEL ST-306 to the stand (ST-20) with screws according to the ST-20 manual.



⚠ WARNING	When installing the sports timer using the stand (ST-20), firmly tighten up the fastening screws. If precariously installed, the MODEL ST-306 may yield and fall under wind pressure, vibration or shock, causing serious injury to personnel or damage to the instrument.	❗
	When the sports timer is mounted on the stand (ST-20), never use it when the wind is blowing at a velocity of 15m/s or more. Failure to observe this precaution may cause fatal accident amd property damage.	⊘

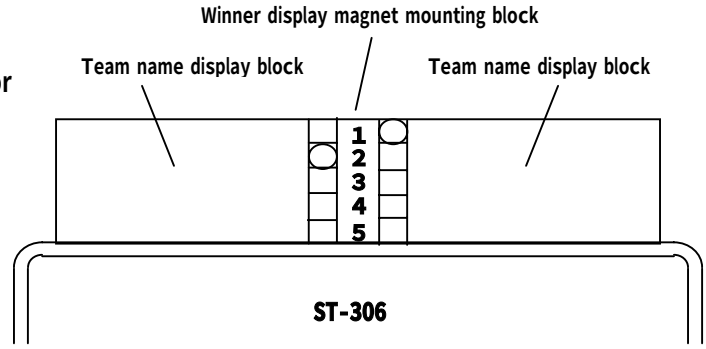
(b) Roof rack attachment (ST-21)

This option is an option used for mounting the sports timer on the car roof. Mount the sports timer according to the ST-21 manual. Depending on the type of car, the roof rack attachment may not fit. For details of the roof rack, consult your nearby car accessories dealer.

⚠ WARNING	When installing the sports timer using the stand (ST-20) or car roof rack attachment (ST-21), firmly tighten up the fastening screws. If precariously installed, the instrument may yield and fall under wind pressure, vibration or shock, causing serious injury to personnel or damage to the instrument.	❗
	When the sports timer is mounted on the car roof rack using the attachment (ST-21), limit the car speed to less than 30km/h. Failure to observe this precaution may cause fatal accident and property damage due to fall of the instrument.	⊘

(c) Team name display unit(ST-24)

This is mounted on top of the sports timer, MODEL ST-306, to display the team names and set points. The unit has two slotted screens, each accommodating a card board or film showing the team name. For details, refer to the ST-24 manual (PROCEDURE FOR ASSEMBLING AND INSTALLATION).

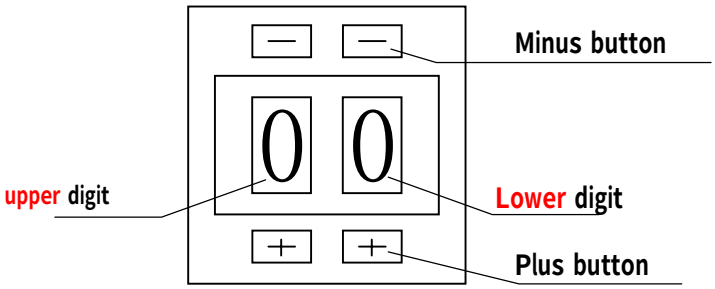


⚠ WARNING	When installing the team name display unit (ST-24), be sure to engage the round bars into the mating holes and tighten up the thumb nuts firmly. Failure to observe this precaution may cause serious injury to personnel due to fall of the display unit under the influence of wind, vibration or shock.

7 SETTING OF FUNCTION SWITCH

This is a two-digit switch used to select a function number for a specific application.

Note:
To change the FUNCTION switch setting (function number), turn off the **POWER** switch first, change the FUNCTION switch setting, and then turn on the **POWER** switch again. The FUNCTION switch is disabled while the MODEL ST-306 is in operation. The MODEL ST-306 will not work when the FUNCTION switch is set at any number other than specified as effective in the list on page 42.

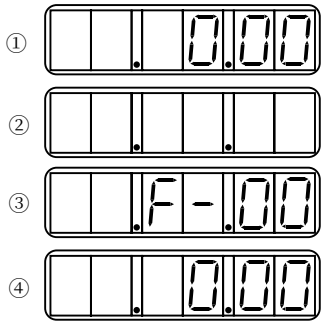


FUNCTION

Confirmation of FUNCTION switch setting (function number)

[Ex.] When the FUNCTION switch is set at "xx":- (x: 0-9)

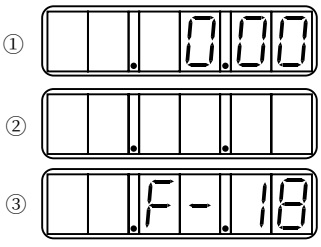
1) Set the POWER switch to ON.
2) The entire display will be blacked out.
3) The function number which has been set will be displayed preceded by code "F-" for 1 second. ("F-xx") ("F-00" in the illustrated example)
4) The MODEL ST-306 will operate as directed by a specific combination of the parameter settings of the switches.



Where a function number not appearing on the function number list (p. 42) is set:-

[Ex.] When the FUNCTION switch is set at "18":-

1) Turn ON the POWER switch.
2) The entire display will be blacked out.
3) The function number which has been set will be displayed preceded by code "F-". ("F-xx") ("F-18" in the illustrated example)
4) The display will freeze at "F-xx".
5) Turn off the POWER switch, correct the FUNCTION switch setting, and then turn ON the POWER switch again.



8 APPLICATION (1): UPCOUNTING MODE

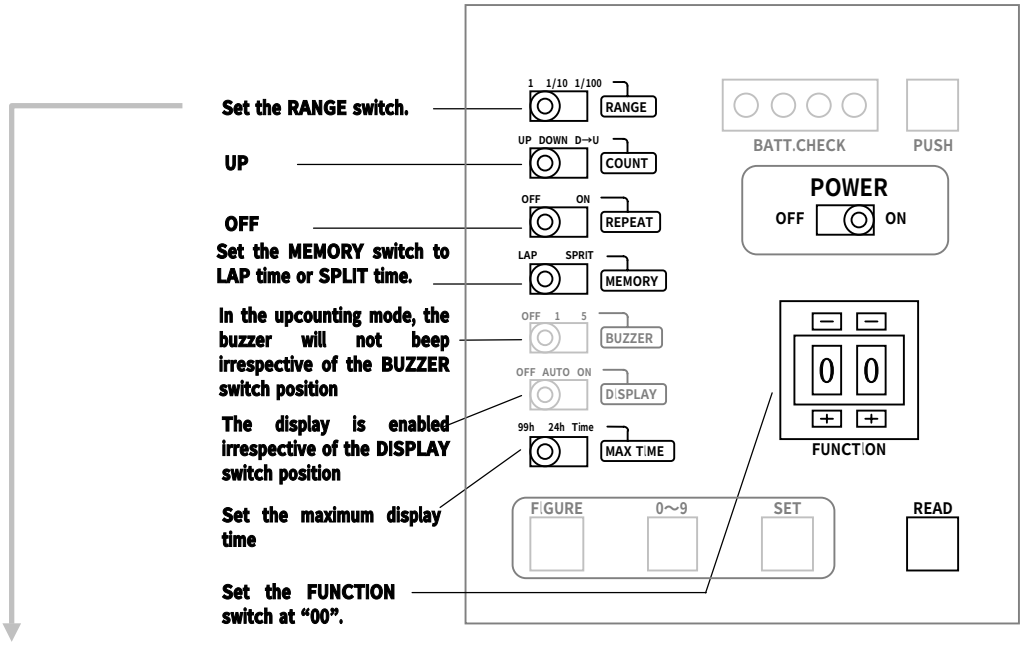
UPCOUNTING

Display of: Running time, lap time, split time and finish time

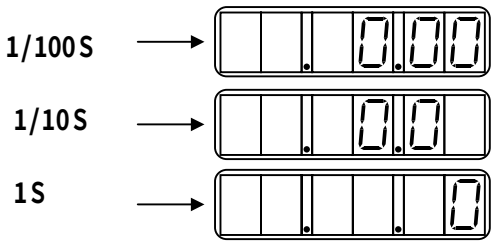
(1) Upcounting from "0"

(a) Initial settings

1) Set the FUNCTION switch at "00".
2) Turn on the POWER switch.
3) Set the slide switches as shown at right

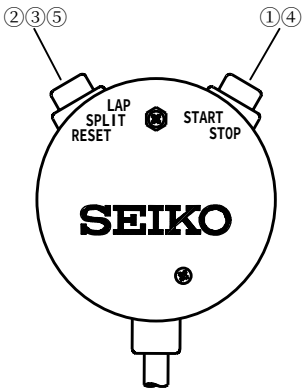


By setting the RANGE switch, the display will show:



NOTE: The decimal fractions of a second (1/10s digit and 1/100s digit) will not be displayed during counting..

(b) Running time counting and display



1) Press the START/STOP switch to start the sports timer.
2) Press the LAP/SPLIT/RESET button of the grip switch, and the sports timer display will freeze immediately. After about 5 seconds of LAP or SPLIT time display, the sports timer will return to the running time display mode.
Every single push of LAP/SPLIT/RESET switch will be memorized as LAP or SPLIT time. When the LAP/SPLIT /RESET switch is pressed while the display is in a freeze, the LAP or SPRIT time will be committed to memory, but the time on display will not change.
The memory has a capacity of 25-time recordings, When the LAP/SPRIT/RESET switch is pressed more than 25 times, the data for LAP time are updated while 25 SPLIT times will remain from the first press.
Namely, in case of SPLIT time, the data will not be updated after 25 times the data for LAP time.
Even when the SPLIT time cannot be recorded because of memory full status, it is displayed in a 5 second freeze when the LAP/SPLIT/RESET switch is pressed.

When the MEMORY switch is set to the SPLIT mode:-

3) Whenever the LAP/SPLIT/RESET switch is pressed, the running time will be displayed for about 5 seconds in a freeze.

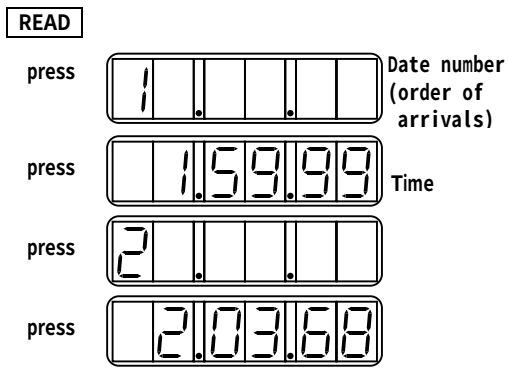
When the MEMORY switch is set to the LAP mode:-

3) Whenever the LAP/SPLIT/RESET switch is pressed, the time elapsed from the previous press will be displayed for about 5 seconds in a freeze.

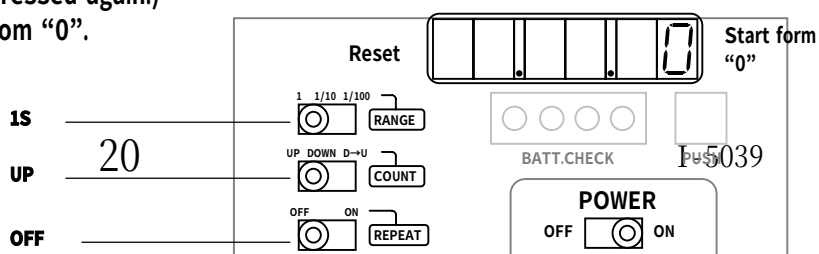
4) Press the START/STOP switch to stop the time counting.
5) When the LAP/SPLIT/RESET switch is pressed, the sports timer display will be cleared to 0.(0.0,0.00), making the sports timer ready for the next heat. The memory data will be maintained until the START/STOP switch is pressed

(c) Memory call

When the time counting is at a standstill, the memory data can be called up by pressing the READ switch. At every push of the READ switch, the LAP/SPLIT number or the order of arrival (data number) and the time will be displayed alternately as illustrated at right. When all data have been read out, a push to the READ switch will return you to the data number "1" again, and you can display memory data again the same way. To restart the sports timer for the next run after memory call, press the LAP/SPLIT/RESET button of the grip switch.(The sports timer will not restart unless the LAP/SPLIT/RESET switch is pressed again.) The sports timer will restart only from "0".



(2) Upcounting from a preset time



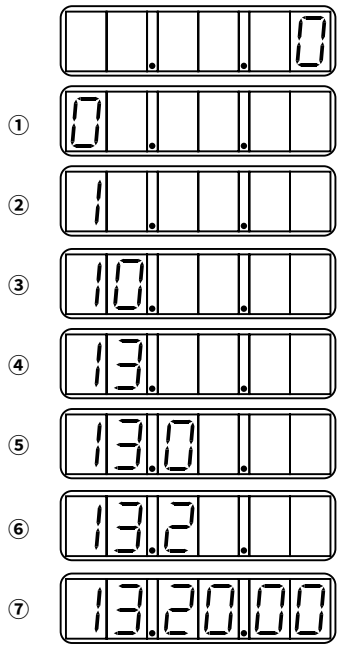
(a) Initial settings

1) Set the FUNCTION switch at "00".
2) Set the POWER switch to ON.
3) Set the slide switches as shown at right

(b) Time setting

[Ex.] 13h20m00s
(When the RANGE switch is set at "1".)

1) Give a push to the FIGURE switch, and the 10s digit (= 10s digit of hours) will be selected.



2) Give a push to the 0-9 switch, and "1" will be entered in the 10s digit

3) Give a push to the FIGURE switch, and you will be stepped to the next place (1s digit of hours).

4) Press the 0-9 switch three times, and "3" will be entered in the 1s digit

5) Give a push to the FIGURE switch, and you will be stepped to the next place (1/10s digit = 10s digit of minutes).

6) Press the 0-9 switch two times, and "2" will be entered into the 1/10s digit

7) Press the SET switch to save the time setting

(The sports timer will not start unless the SET switch is pressed.)

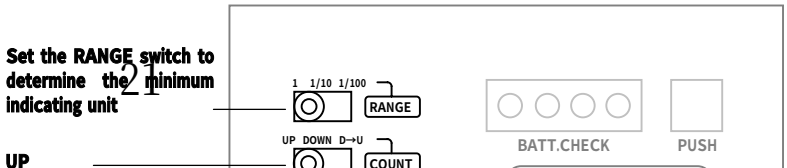
In case the RANGE switch is set at 1/10 or 1/100, the hours digits cannot be set.

(The maximum time rage is 59m59s, provided that the fractions of a second cannot be set.)

(c) Operation

1) Press the START/STOP switch, and the sports timer will start counting.
2) Another push to the START/STOP switch will stop the sports timer.

9 APPLICATION (2): REPETITIVE UPCOUNTING MODE



REPETITIVE UPCOUNTING (UP)

(1) Initial settings

1) Set the FUNCTION switch at "00".

2) Set the POWER switch to ON.

3) Set the slide switches as shown at right.

(2) Time setting

[Ex.] 1m30s

(RANGE switch setting: 1)

1) Give a push to the FIGURE switch

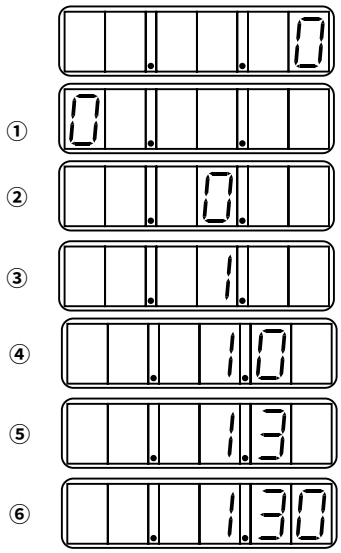
2) Press the FIGURE switch three times further, and you will be stepped three places rightwards to 1s digit (= 1s digit of minutes).

3) Give a push to the 0-9 switch.

4) Give a push to the FIGURE switch, and you will be stepped to the next place (10s digit of seconds).

5) Press the 0-9 switch three times.

6) Press the SET switch to save the time setting.
(The sports timer will not start unless the SET switch is pressed.)



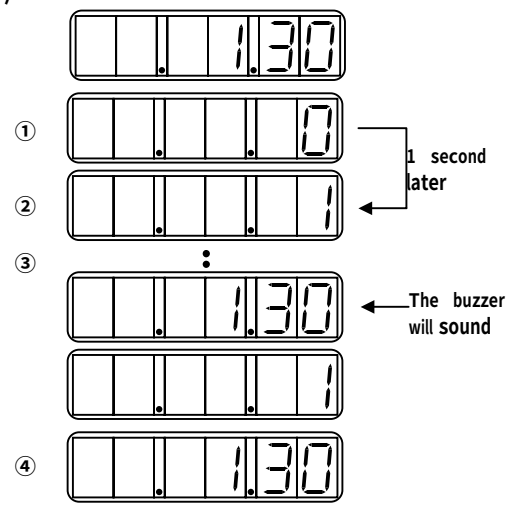
(3) Operation and display

1) Press the LAP/SPLIT/RESET switch, and the sports timer display will be cleared to "0".

2) Press the START/STOP switch to start upcounting

3) The upcounting will be repeated cyclically unless the START/STOP switch is pressed.
(When the START/STOP switch is pressed, the sports timer will be brought to a pause.)
Every time the preset time (=1m30 sec. in this examples) is reached, the buzzer will beep.

4) The sports timer will be initialized when the LAP/SPLIT/RESET switch is pressed with the timer at a pause.

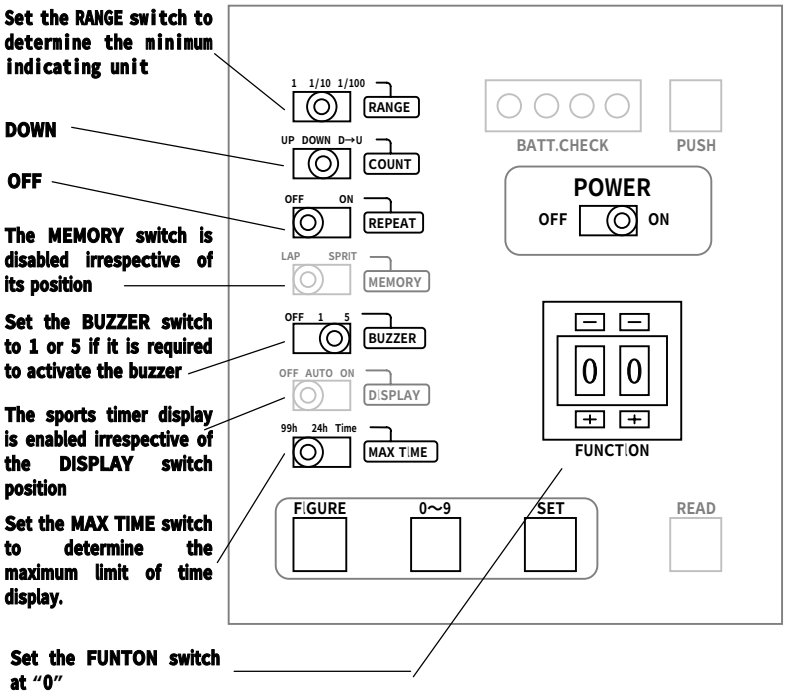


10 APPLICATION (3): DOWNCOUNTING MODE

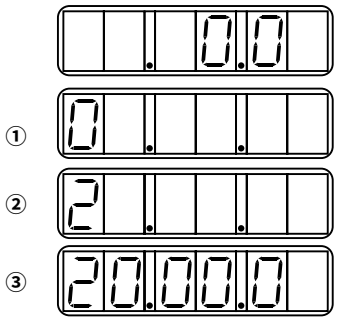
DOWNCOUNTING (COUNT DOWN)
Display of: Game time

(1) Initial settings

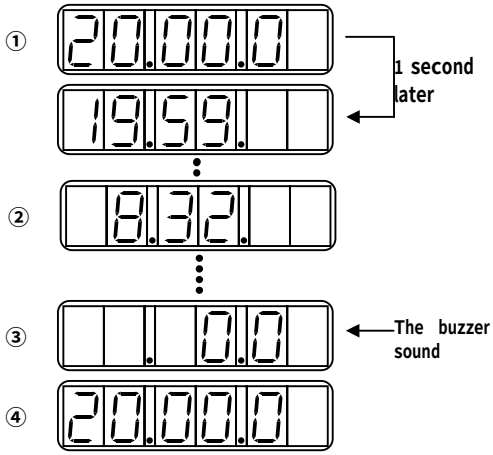
1) Set the FUNCTION switch at “00”.
2) Set the POWER switch to ON.
3) Set the slide switches as shown at right



(2) Time setting
[Ex.] 20m00s0
(When the RANGE switch is set at 1/10.)
1) Give a push to the FIGURE switch.
2) Press the 0-9 switch two times.
3) Press the SET switch to save the setting. When the SET switch is pressed, each of the digits to the right of the digit in which numerical data is entered last will be set to “0”.
*To set two digits or more, repeat the steps 1) and 2), and press the SET switch when all the required digits have been set.



(3) Operation and display
1) Press the START/STOP switch to start downcounting.
2) Press the START/STOP switch to bring the sports timer to a pause.
Every time the START/STOP switch is pressed, the sports timer will start and stop downcounting alternately.
The sports timer will display time according to the RANGE setting.
3) At once the time is counted down to “0”, the buzzer will beep.
4) To repeat the downcounting from the same preset time, press the LAP/SPLIT/RESET switch, and press the START/STOP switch. The sports timer will display time according to the RANGE setting



11 APPLICATION (4): REPETITIVE DOWNCOUNTING MODE

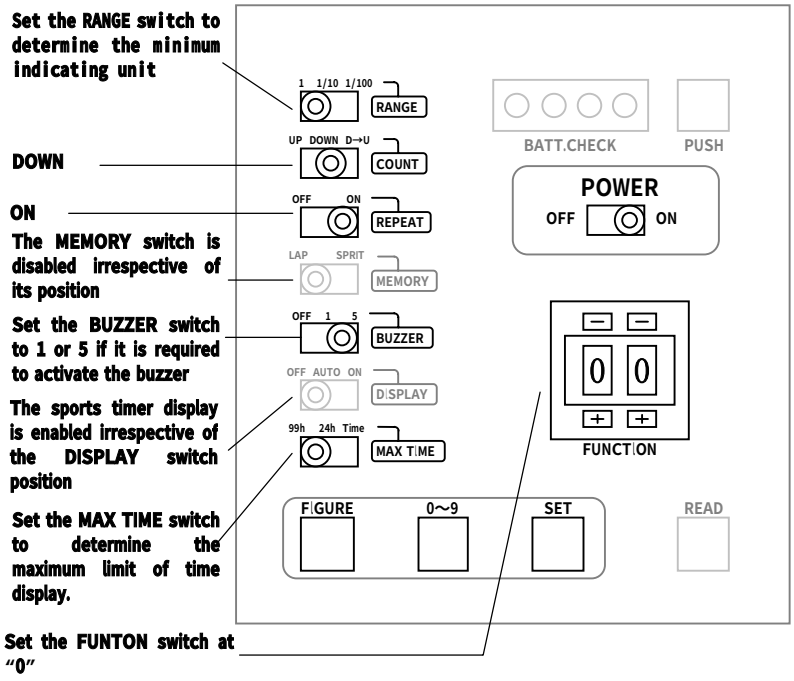
REPETITIVE DOWNCOUNTING (DOWN)

(1) Initial settings

1) Set the FUNCTION switch at "00".

2) Set the POWER switch to ON.

3) Set the slide switches as shown at right



(2) Time setting

[Ex.] 4m30s

1) Give a push to the FUNCTION switch.

2) Press the FIGURE switch three times, and "0" will be stepped three places to the right.

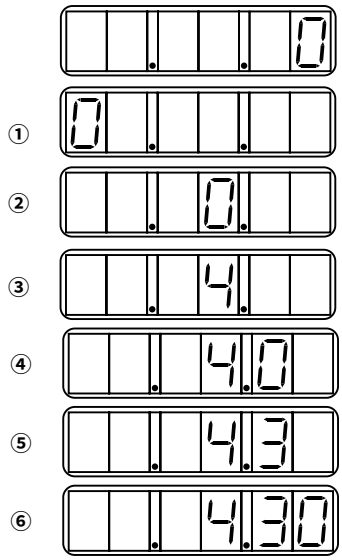
3) Press the 0-9 switch 4 times.

4) Give a push to the FIGURE switch, and you will be stepped to the next digit (10s digit of seconds here).

5) Press the 0-9 switch three times.

6) Press the SET switch.

(Unless the SET switch is pressed, the sports timer cannot be readied for downcounting.)



(3) Operation and display

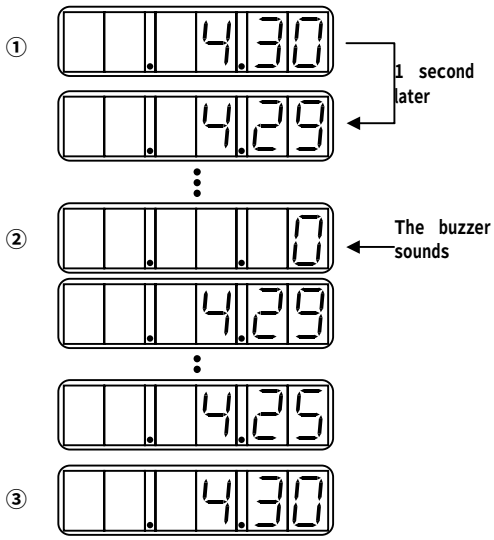
1) Press the START/STOP switch, and the sports timer will start downcounting.

2) The downcounting will be repeated cyclically unless the START/STOP switch is pressed.

(When the START/STOP switch is pressed, the sports timer will be brought to a pause.)

Every time "0" is reached, the buzzer will beep.

3) Pressing the LAP/SPLIT/RESET switch while the sports timer is at a pause will initialize the sports timer.

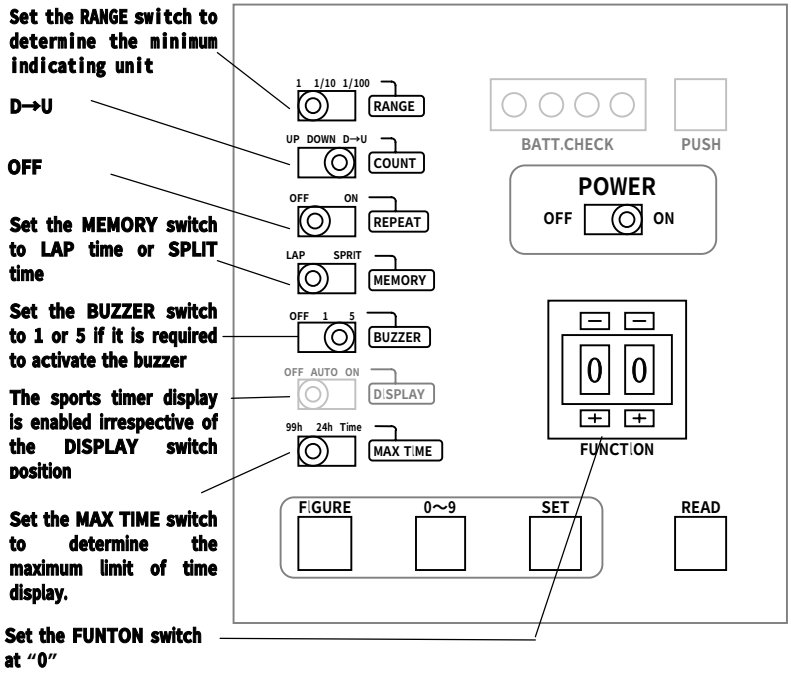


12 APPLICATION (5): MANUAL CROSSOVER COUNTING MODE

DOWNCOUNTING→O (STOP)→MANUAL UPCOUNTING BY GRIP SWITCH

(1) Initial settings

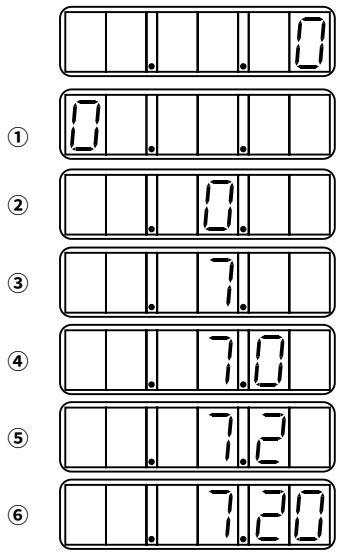
1) Set the FUNCTION switch at "00".
2) Set the POWER switch to ON.
3) Set the slide switches as shown at right



(2) Time setting

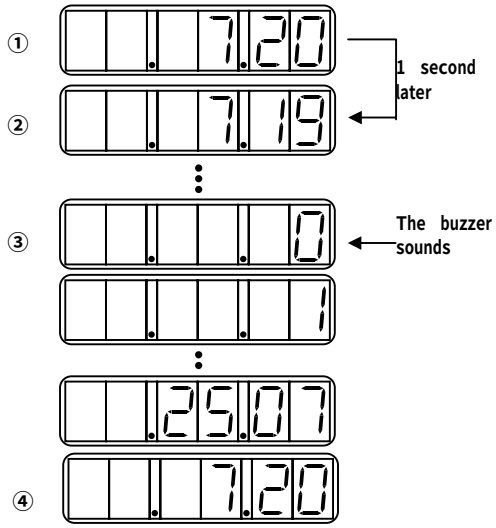
[Ex.] 7m20s
(RANGE switch setting: 1)

1) Give a push to the FUNCTION switch.
2) Press the FIGURE switch three times further, and you will be stepped three places rightwards to 1s digit (= 1s digit of minutes).
3) Press the 0-9 switch seven times.
3) Give a push to the FIGURE switch, and you will be stepped one place to the right.
5) Press the 0-9 switch two times.
6) Press the SET switch.
(The sports timer will not start unless the SET switch is pressed.)



(3) Operation and display

1) Press the START/STOP switch, and the sports timer will start counting.
2) Countdown
Every time the START/STOP switch is pressed, the sports timer will start and stop downcounting alternately.
3) When "0" is reached, the downcounting will be stopped, and at the same time the buzzer will beep.
When the START/STOP switch is pressed, the sports timer will start upcounting.
4) The sports timer will be initialized by pressing the LAP/SPLIT/RESET switch when the sports timer is at a standstill.

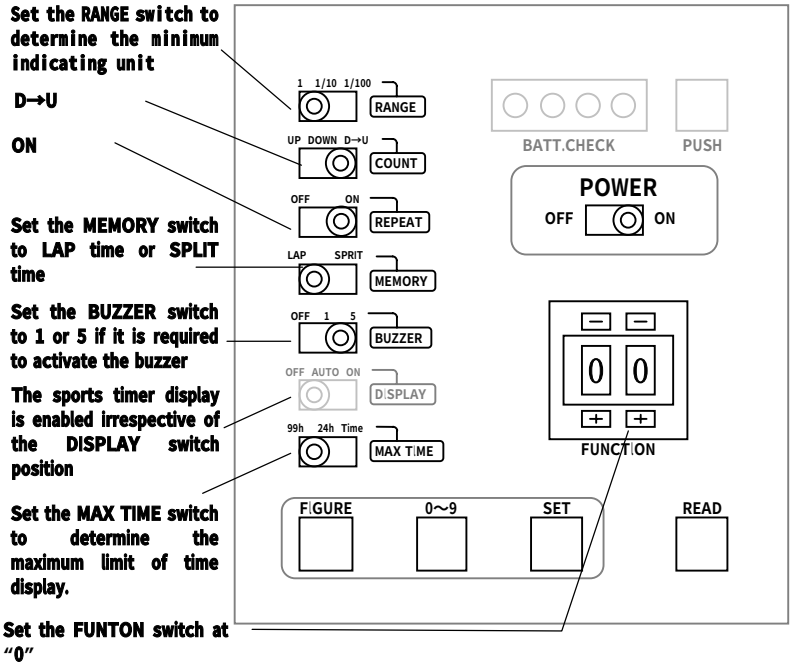


13 APPLICATION (6): AUTOMATIC CROSSOVER COUNTING MODE

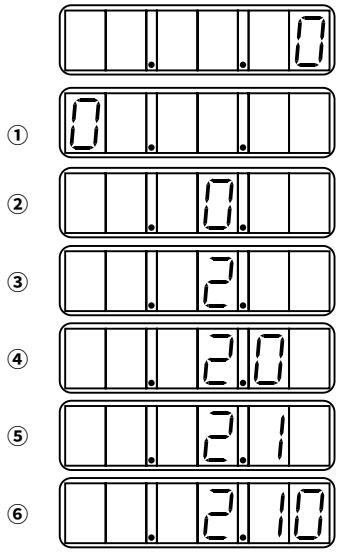
DOWNCOUNTING→ZERO (0) CROSSING ZERO WITHOUT STOP→UPCOUNTING

(1) Initial settings

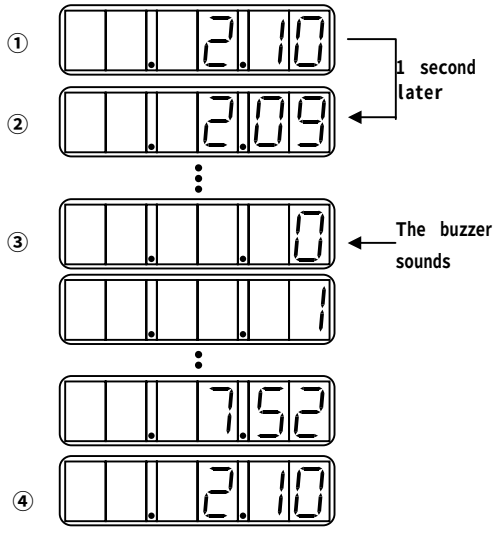
1) Set the FUNCTION switch at "00".
2) Set the POWER switch to ON.
3) Set the slide switches as shown at right.



(2) Time setting
[Ex.] 2m10s
(RANGE switch setting: 1)
1) Give a push to the FUNCTION switch.
2) Press the FIGURE switch three times further, and you will be stepped three places rightwards to 1s digit (= 1s digit of minutes).
3) Press the 0-9 switch two times.
4) Give a push to the FIGURE switch, and you will be stepped one place to the right.
5) Give a push to the 0-9 switch.
6) Press the SET switch.
(The sports timer will not start unless the SET switch is pressed.)



(3) Operation and display
1) Press the START/STOP switch, and the sports timer will start counting.
2) Countdown
Every time the START/STOP switch is pressed, the sports timer will start and stop downcounting alternately.
3) Just when the time is counted down to "0", the buzzer will beep, and at the same time, downcounting mode is automatically changed over to upcounting mode.
4) The sports timer will be initialized by pressing the LAP/SPLIT/RESET switch when the sports timer is at a standstill.



14 APPLICATION (7): TIME OF DAY DISPLAY MODE

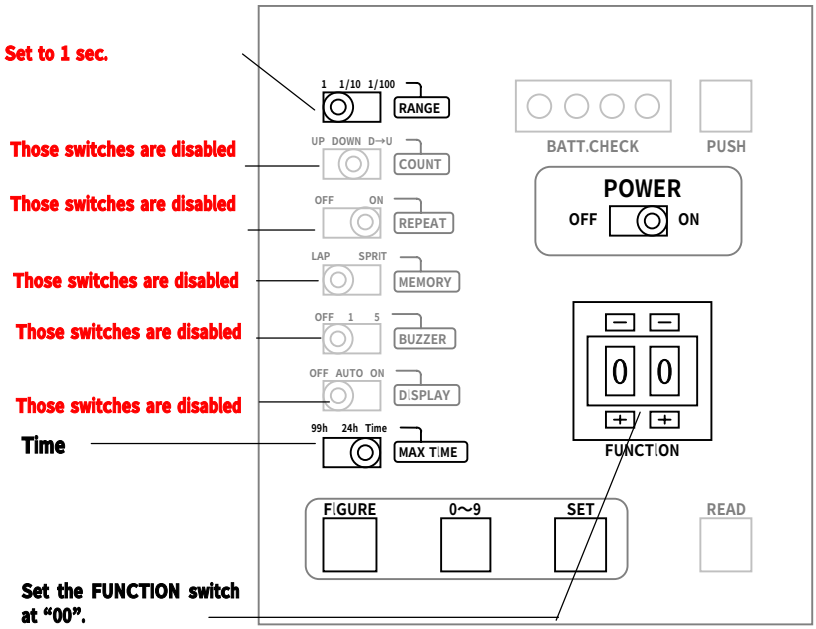
TIME OF DAY DISPLAY MODE
(DISPLAY IN THE MILITARY
24-HOUR SYSTEM)

(1) Initial settings

1) Set the FUNCTION switch at "00".

2) Set the POWER switch to ON.

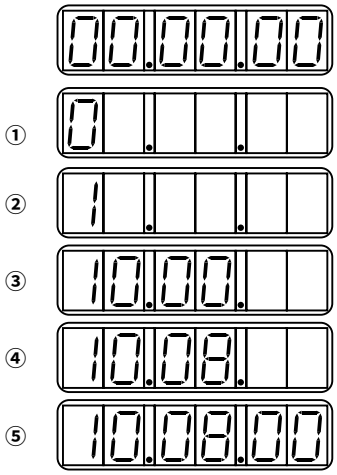
3) Set the MAX TIME to “Time”



(2) Time setting

[Ex.] 10h8m00s
(RANGE switch setting: 1), to set the current time referring to your watch.)

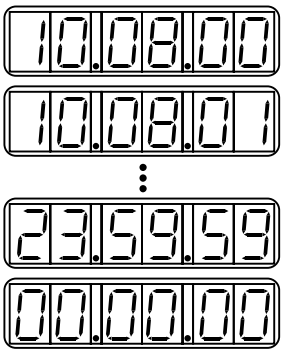
1) Give a push to the FUNCTION switch.
2) Give a push to the 0-9 switch.
3) Press the FIGURE switch three times further, and you will be stepped three places rightwards to 1s digit of minutes.
4) Press the 0-9 switch eight times.
5) Press the SET switch.
(The sports timer will not start unless the SET switch is pressed when the time is set, one to two minutes advanced time shall be set.)



(3) Operation and display

1) Press the START/STOP switch, at the tone of “exact time”, and the sports timer will start counting. as a Day Clock.

2) Countup
The upcounting will be repeated cyclically unless the START/STOP switch is pressed.



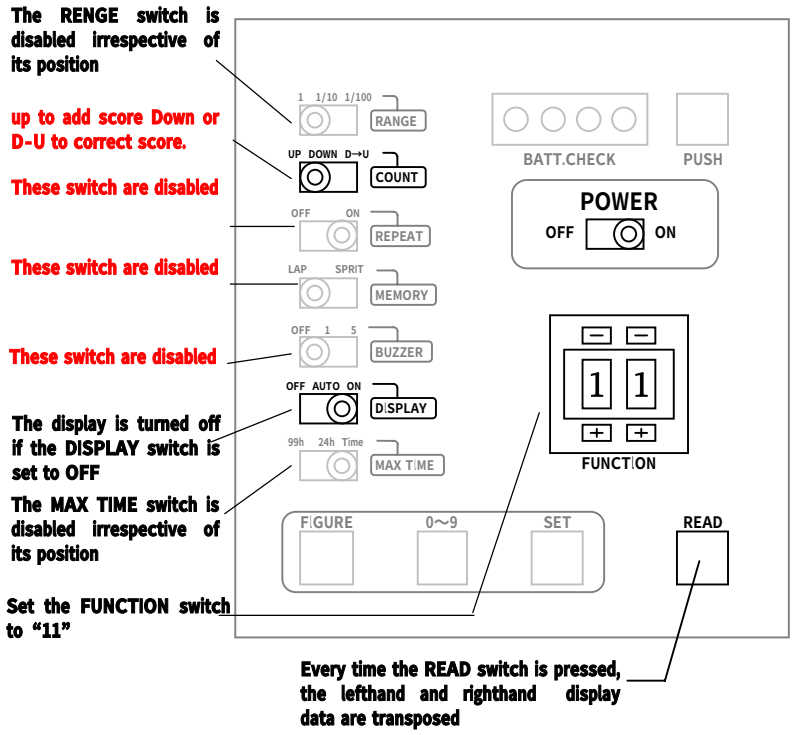
NOTE: In the TIME of Day display mode, the LAP/SPLIT function is disabled.By pressing the LAP/SPLIT/RESET switch when the sports timer is at rest, its display will be cleared to zeros.

15 APPLICATION (8): SCOREBOARD MODE (STANDARD)

STANDARD SCOREBOARD MODE

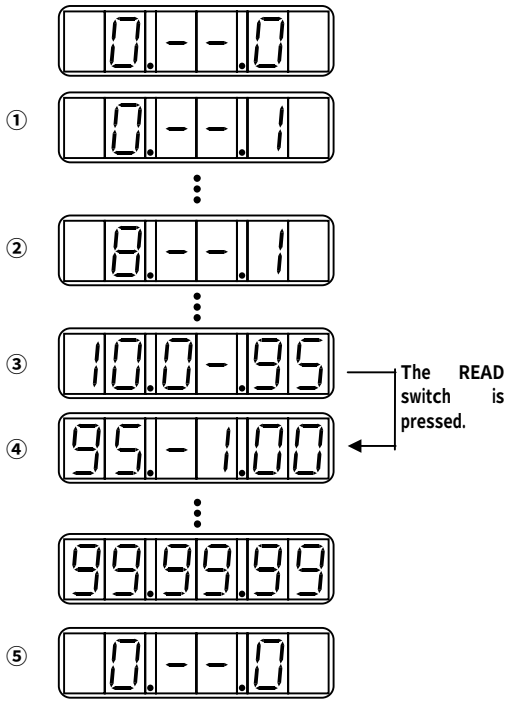
(1) Initial settings

1) Set the FUNCTION switch at “11”.
2) Set the POWER switch to ON.
3) Set the slide switches as shown at right



(2) Operation and display

1) Press the START/STOP switch, and the righthand side score on the display will be incremented.
2) Press the LAP/SPLIT/RESET switch to increment the lefthand side score on the display.
3) Every time either righthand side or lefthand player or team gains a point, press the START/STOP switch or LAP/SPLIT/RESET switch to increment the score for the corresonding player or team.
4) Press the READ switch change score positions.



5) Hold down the START/STOP switch and LAP/SPLIT/RESET switch simultaneously for 1 second, and both scores will be reset to zeros.

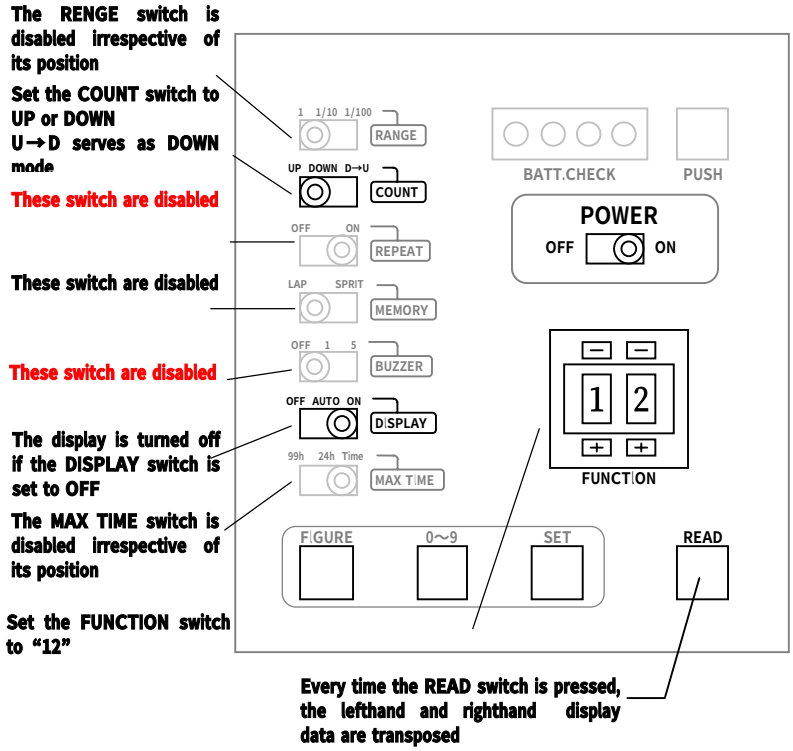
< Procedure for correcting the score by subtraction >
Set the COUNT switch to “DOWN”, and operate the grip switch for the side whose score is to be corrected.
NOTE: After correction, be sure to set the COUNT switch to “UP”.

16 APPLICATION (9): SCOREBOARD MODE (TENNIS)

TENNIS SCOREBOARD MODE

(1) Initial setting

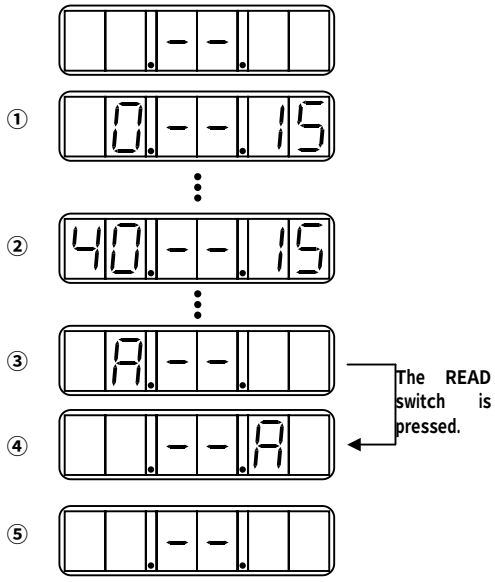
1) Set the FUNCTION switch to “12”.
2) Turn ON the POWER switch.
3) Set the slide switches as shown at right.



(2) Operation and display

※ Default setting for deuce is “40”.
(It can be changed by following the procedure explained in (3) “Setting of initial value” below.

1) Press the START/STOP switch to add points to the righthand side score on the display.
2) Press the LAP/SPLIT/RESET switch to add points to the lefthand side score on the display.
3) Every time either righthand side or lefthand player or team gains a point, press the START/STOP switch or LAP/SPLIT/RESET switch to increment the score for the corresponding player or team.
4) Press the READ switch changes score position.
5) Hold down the START/STOP switch and LAP/SPLIT/RESET switch simultaneously for 1 second, and both scores will be reset.



< Procedure for correcting the score by subtraction >
Set the COUNT switch to “DOWN”, and operate the grip switch for the side whose score is to be corrected.
NOTE: After correction, be sure to set the COUNT switch to “UP”.

(3) Setting of initial value (for determination of deuce points)

※ The default setting (deuce points) just after power-up is "40".

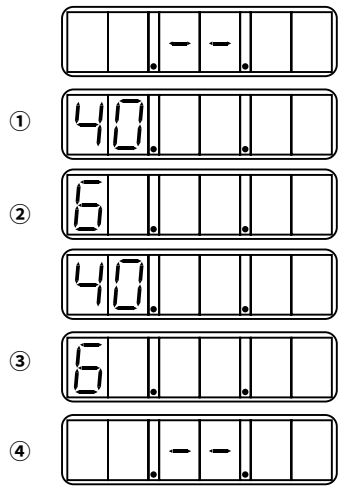
[Ex.] tie-break

1) Give a push to the FIGURE switch.

2) Give a push to the 0-9 switch.

3) the deuce points are toggled between 40 and 6 at every push of the 0-9 switch.

4) Press the SET switch.
(The sports timer will not start unless the SET switch is pressed.)



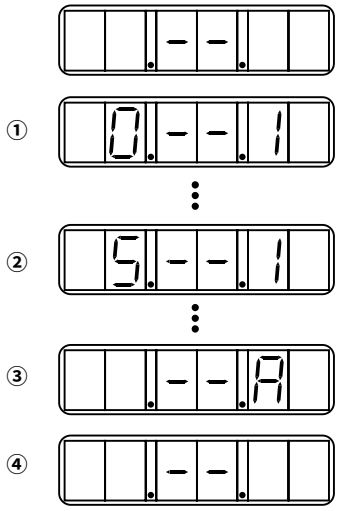
< Operation and display in case of tie-break >

1) Press the START/STOP switch to increment the righthand side score on the display.

2) Press the LAP/SPLIT/RESET switch to increment the lefthand side score on the display.

3) Every time either righthand side or lefthand player or team gains points, press the START/STOP switch or LAP/SPLIT/RESET switch to increment the score for the corresonding player or team.

4) Hold down the START/STOP switch and LAP/SPLIT/RESET switch simultaneously for 1 second, and both scores will be reset.



17 APPLICATION (10): SCOREBOARD MODE (SOFT TENNIS)

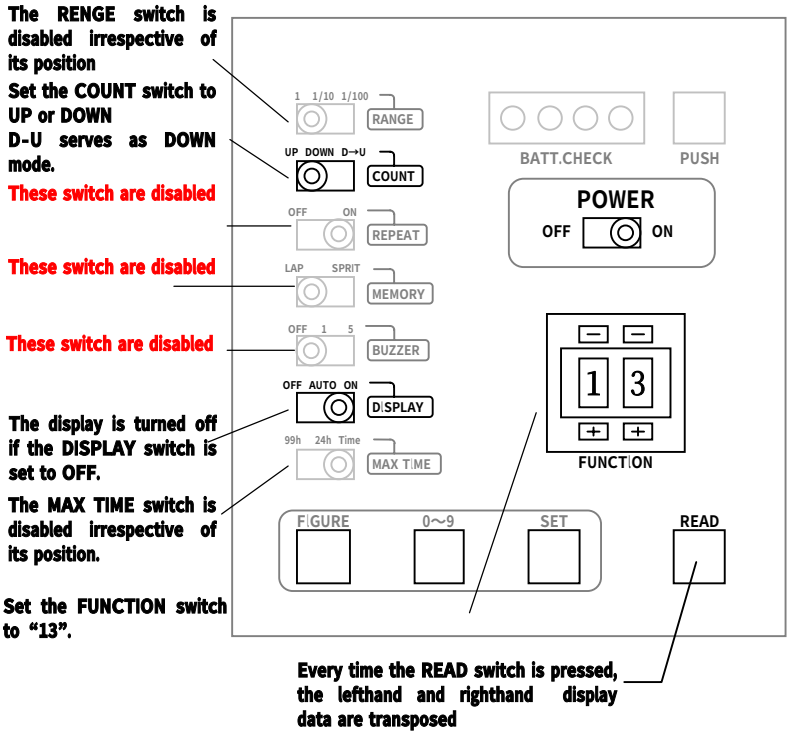
SOFT TENNIS SCOREBOARD MODE

(1) Initial settings

1) Set the FUNCTION switch at “13”.

2) Set the POWER switch to ON.

3) Set the slide switches as shown at right.



(2) Operation and display

※ Default setting for deuce points is “3”.
(It can be changed by following the procedure explained in (3) “Setting of initial value” below.

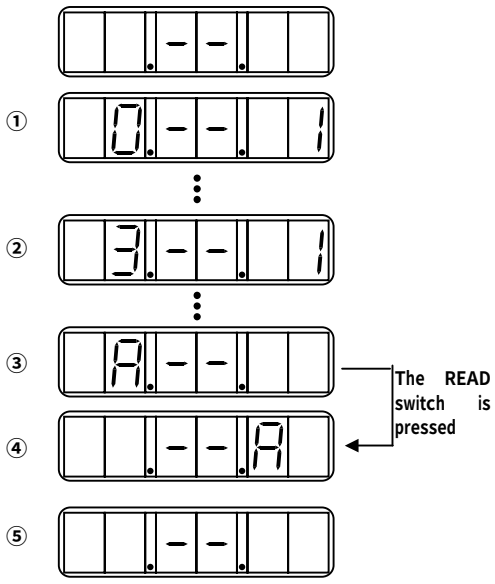
1) Press the START/STOP switch to increment the righthand side score on the display.

2) Press the LAP/SPLIT/RESET switch to increment the lefthand side score on the display.

3) Every time either righthand side or lefthand player or team gains points, press the START/STOP switch or LAP/SPLIT/RESET switch to increment the score for the corresonding player or team.

4) Press the READ switch changes score position.

5) Hold down the START/STOP switch and LAP/SPLIT/RESET switch simultaneously for 1 second, and both scores will be reset.



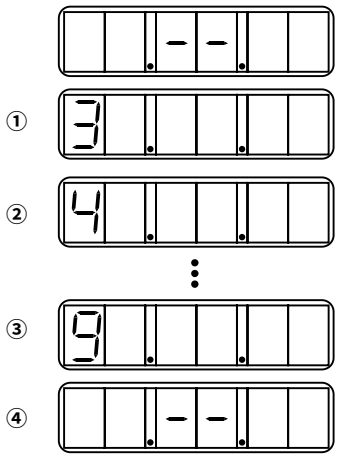
< Procedure for correcting the score by subtraction >
Set the COUNT switch to “DOWN”, and operate the grip switch for the side whose score is to be corrected.
NOTE: After correction, be sure to set the COUNT switch to “UP”.

(3) Setting of initial value (for determination of deuce points)

※The default setting (deuce points) just after power-up is “3”.

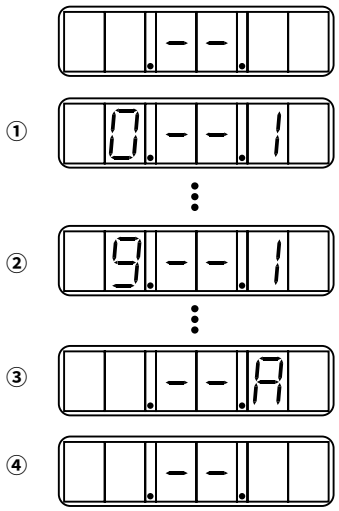
[Ex.] To change the deuce points to 9:-

1) Give a push to the FIGURE switch.
2) Give a push to the 0-9 switch.
3) By joggling the 0-9 switch, the number at the place selected by the FIGURE switch can be changed incrementally from 3 to 9. When 9 is reached, a push cycles the number back to 3, from which the same incremental process can be repeated. (Set the deuce points to “9”.)
4) Press the SET switch.
(The sports timer will not start unless the SET switch is pressed.)



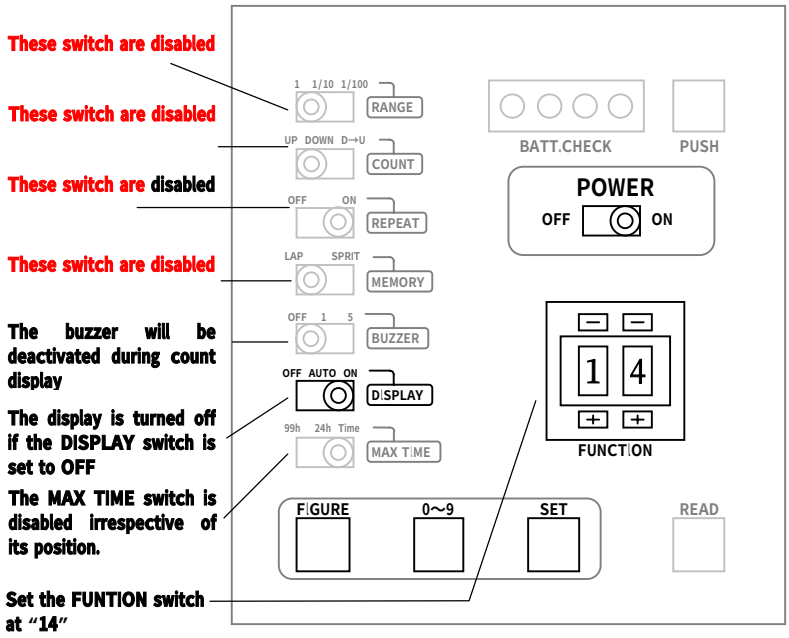
< Operation and display >

1) Press the START/STOP switch to add points to the righthand side score on the display.
2) Press the LAP/SPLIT/RESET switch to add points to the lefthand side score on the display.
3) Every time either righthand side or lefthand player or team gains points, press the START/STOP switch or LAP/SPLIT/RESET switch to increment the score for the corresonding player or team.
4) Hold down the START/STOP switch and LAP/SPLIT/RESET switch simultaneously for 1 second, and both scores will be reset.



18 APPLICATION (11): SCOREBOARD MODE (COUNT DISPLAY)

SCOREBOARD COUNT DISPLAY MODE



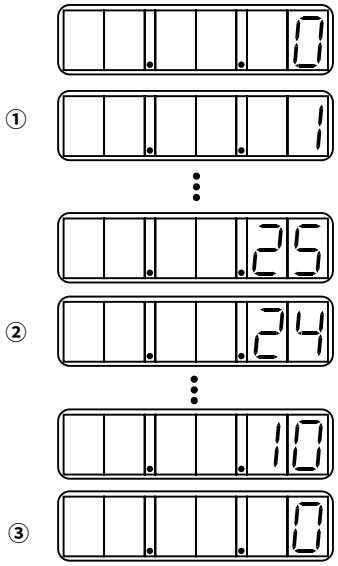
(1) Initial setting

1) Set the FUNCTION switch at "14".

2) Turn the POWER switch to ON.

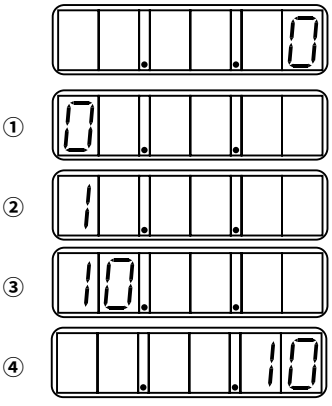
3) Set the slide switches as shown at right.

(2) Operation and display



1) When the START/STOP switch is given a push, the count will be incremented.
2) When the LAP/SPLIT/RESET switch is given a push, the count will be decremented.
3) The display will be reset to zero when the START/STOP switch and LAP/SPLIT/RESET switch are held down simultaneously for 1 second.

(3) Setting of initial value



[Ex.] Count = 10

1) Give a push to the FIGURE switch.
2) Give a push to the 0-9 switch.
3) Give a push to the FIGURE switch, and you will be stepped one place to the right.
4) Press the SET switch.

19 HOOK-UP WITH OTHER EQUIPMENT

NOTE: When external equipment is connected to the MODEL ST-306, the display mode vs. DISPLAY switch setting relationship is as follows:
OFF: Blacked out AUTO: Blacked out when the signal line is cut off or no data is detected
ON: Steady ON
When connecting external equipment to the MODEL ST-306, connect the cable first, set the FUNCTION switch to meet the external equipment connected, and then turn ON the MODEL ST-306 and external equipment.

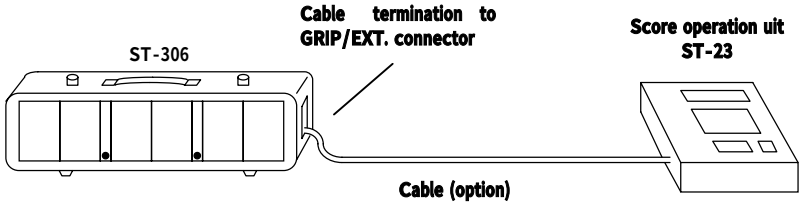
(1) Connection with score operation unit (ST-23)
When combined with the score operation unit (option), the MODEL ST-306 can be used as a three-digit scoreboard having a maximum scoring capacity of 999 points

(a) Setting

Set the FUNCTION switch at "10".

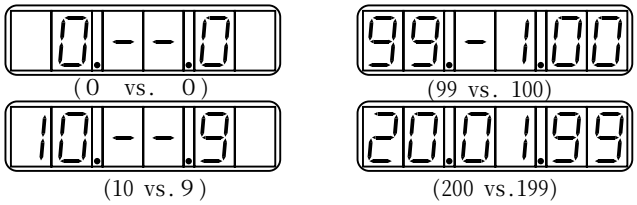
Turn the POWER switch to ON.

(b) Cabling



(c) Display data
Max. 999 points vs. 999 points

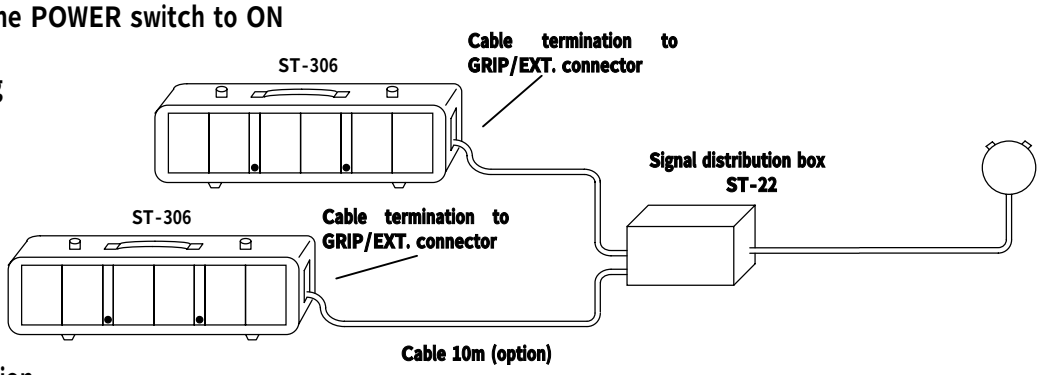
<Display examples>



(2) Connection with signal distribution box (ST-22)

(a) Setting
Set the FUNTION switch "00"
Turn the POWER switch to ON

(b) Cabling



(c) Operation

Using a single grip switch, two units of MODEL ST-306 can be started, stopped, and reset smultaneously. It should be noted, however, that each ST-306 is operating on its own internal clock for counting, and therefore, that CT-1000/916 is necessary for perfect synchronization of the two units.

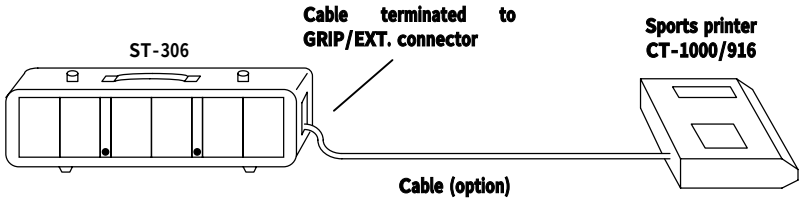
(3) Connection with sports printer (CT-1000/916) (standard operating mode)

(a) Setting

Set the FUNCTION switch at "20".

Turn the POWER switch to ON.

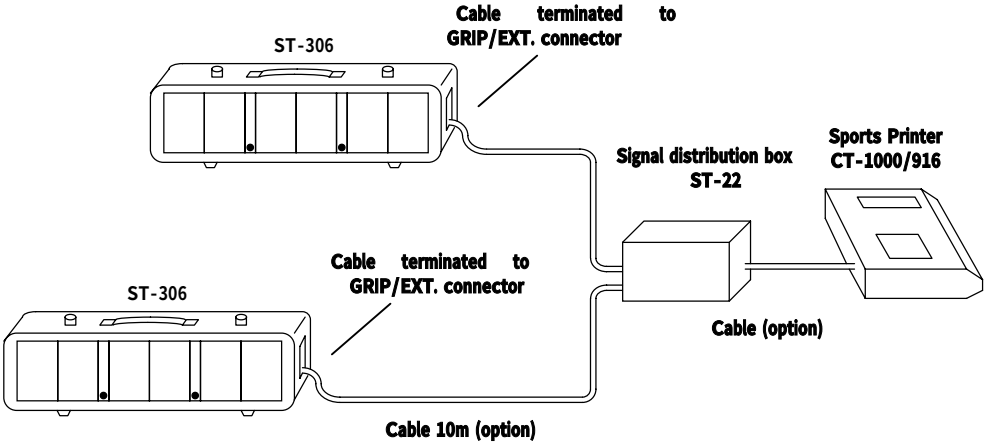
(b) Cabling



< Where signal distribution box (ST-22) is used >

Two units of ST-306 can be connected.

The two units of ST-306 display the time data of CT-1000/916 in perfect synchronism.



(c) Operation

Start/split/lap/finish signals for MODEL ST-306 are all controlled automatically by CT-1000/916.

When the MODEL ST-306 is connected with CT-1000/916, the buzzer in the ST-306 will not beep.

(d) Display data

The running time is displayed at all times.

When a player has reached the finish line, the sports timer will display finish time for about 5 seconds and then return to the running time display mode.

When other players have arrived the finish line during said 5-second period, their finish times will not be displayed.

The display pattern is determined by the RANGE settings of CT-1000/916 and ST-306 as follows.

CT-1000/916 \ ST-306	1／100	1／10	1
1／100	0.00	0.00	0
1／10		0.00	0
1			0

Inhibited (because the display accuracy preposterously becomes higher than the measuring accuracy.)

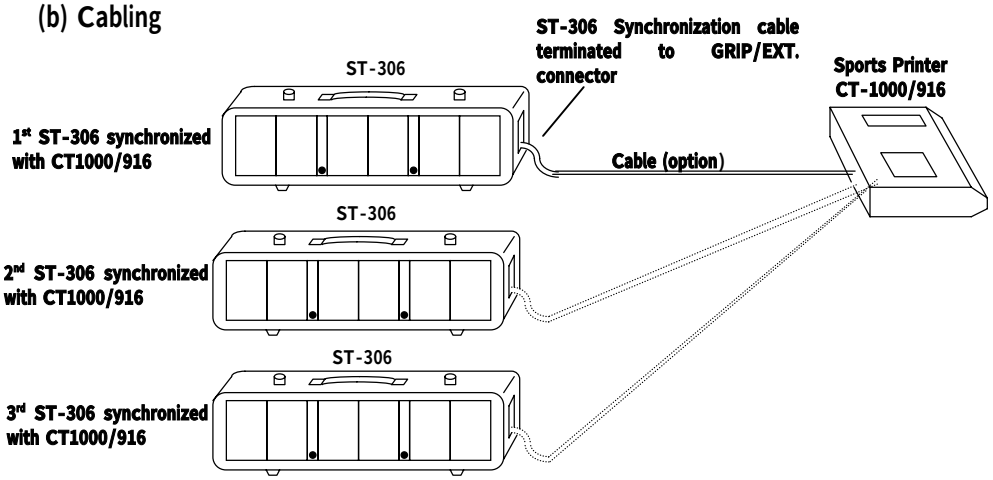
(4) Connection with sports printer (CT-1000/916) (external synchronization mode)

(a) Setting

Set the FUNCTION switch at "21".

Turn the POWER switch to ON.

(b) Cabling



CT-1000/916 is running continuously.

After making sure that the first ST-306 has been synchronized with CT-1000/916, disconnect the synchronization cable from the first ST-306, and connect it to the second ST-306. After making sure that the second ST-306 has been synchronized with CT-1000/916, disconnect the cable from the second ST-306 and connect it to the third ST-306. After making sure that the third ST-306 has been synchronized with CT-1000/916, disconnect the cable.

Even after disconnection of the synchronization cable, three ST-306s will show the same running time as CT-1000/916, except that the timing accuracy of the three ST-306s is governed by their respective internal clocks.

(c) Operation

While being connected with CT-1000/916, ST-306 always displays time data from CT-1000/916.

Once synchronized with CT-1000/916, ST-306 maintains the accuracy by its internal clock. Accordingly, two or more units of ST-306 can be synchronized conveniently using a single unit of CT-1000/916.

NOTE: Use ST-306s with their DISPLAY switches at the position of ON. (If the DISPLAY switch is set to AUTO, the display will be turned off when the cable is disconnected.)

NOTE: When operating ST-306 in the external synchronization mode, do not turn off the POWER switch of ST-306 when disconnecting the synchronization cable.

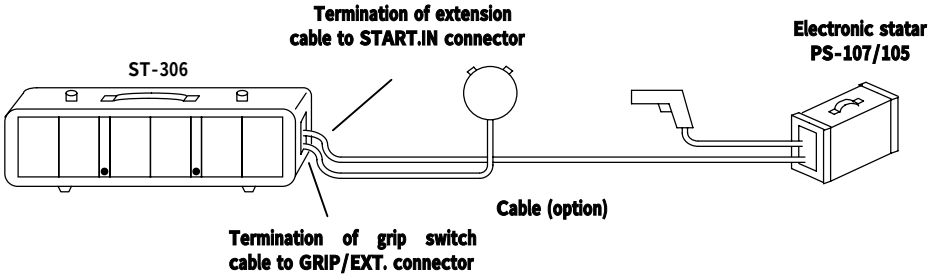
(5) Connection with electronic starter (PS-107/105)

(a) Setting

Set the FUNCTION switch at “00”.

Turn the POWER switch to ON.

(b) Cabling



(c) Operation

ST-306 can be started by the signal sent from the electronic starter PS-107/105. When PS-107/105 is fired two times or more in succession to indicate a flying start, press the START/STOP switch to stop counting, and press the LAP/SPLIT/RESET switch to reset the count to zero in preparation for the next start.

(6) Connection with ski timing system (CT-400/300)

(a) Setting

Set the FUNCTION switch as follows.

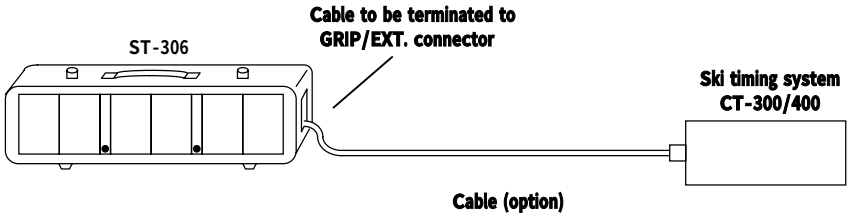
“30” Display of first trial time or total time

“31” Display of first or second trial time

“32” Display of start timer (Note: CT-400 only)

Turn the POWER switch to ON.

(b) Cabling



(c) Operation

Start/Stop/finish signals for MODEL ST-306 are all controlled automatically by CT-400/300.

The RANGE switch of ST-306 is enabled.

(d) Display data

According to the setting of the FUNCTION switch, the display will show: the first trial time or total time; first trial time or second trial time; or start timer time (CT-400 only).

(7) Connection with swimming timing system (PT-7000/6000)

(a) Setting

Set the FUNCTION switch as follows:

"40" Display of running time

"41" Display of running time by way of swimming scoreboard (SB-5010)

"42" Display of running time or the lap time for the first place.

"43" Display of program No. and heat No. by way of swimming scoreboard (SB-5010).

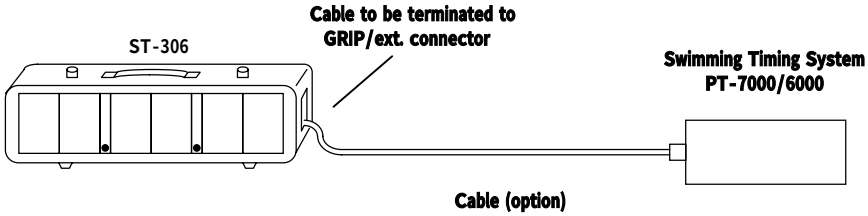
"50-59" Display of split time by the order of arrival.

"60-69" Display of split time by lane No.

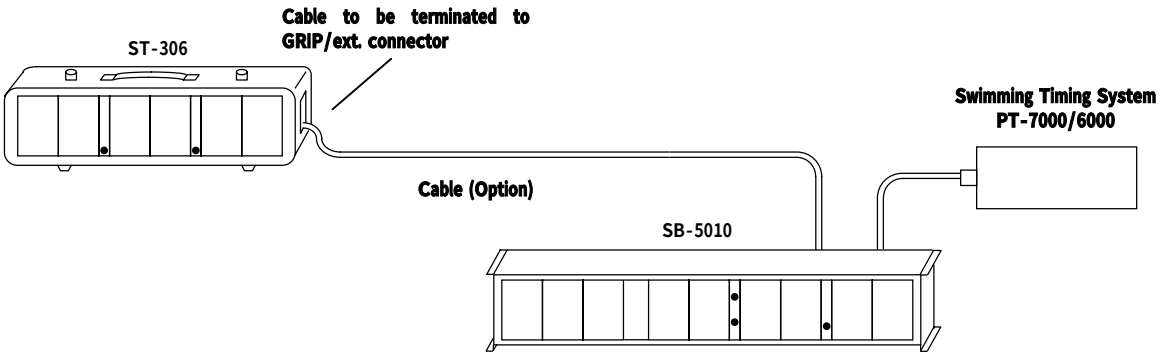
Turn the POWER switch to ON.

(b) Cabling

Where the FUNCTION switch is set at "40". "42". "50-59". or "60-69":-



Where the FUNCTION switch is set at "41" or "43":-



(c) Operation

Start/lap/finish/reset signals for MODEL ST-306 are all controlled automatically by PT-7000/6000.

(d) Display data

The running time, program No., heat No., and the split time as tagged with the order of arrival/lane No. are displayed.

(8) Connection with indoor sports operation board (ST-2000/900/800 series)

(a) Setting

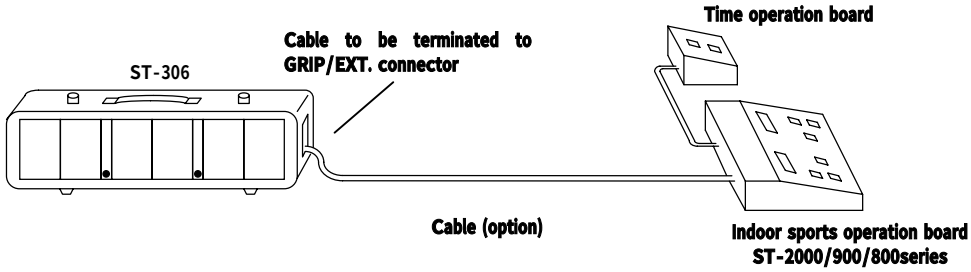
Set the FUNCTION switch as specified below:

"70" Display of game time

"71" Display of scores

Turn the POWER switch to ON.

(b) Cabling



(c) Display data

Game time and scores are displayed.

(9) Connection with running time operation board (RT-120)

(a) Setting

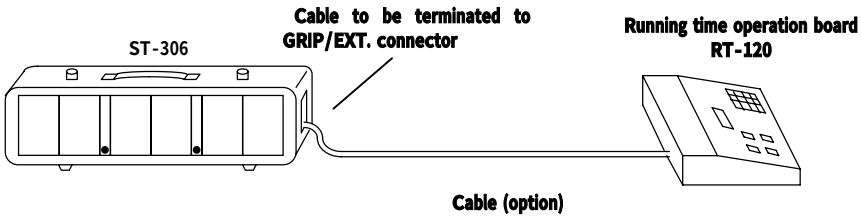
Set the FUNCTION switch as follows:

"80" Display of running time

"81" Display of bib number

Turn the POWER switch to ON.

(b) Cabling



(c) Display data

The running time and bib number are displayed.

The RANGE switch of ST-306 is enabled.

(10) Digital anemometer operation board (WG-200)

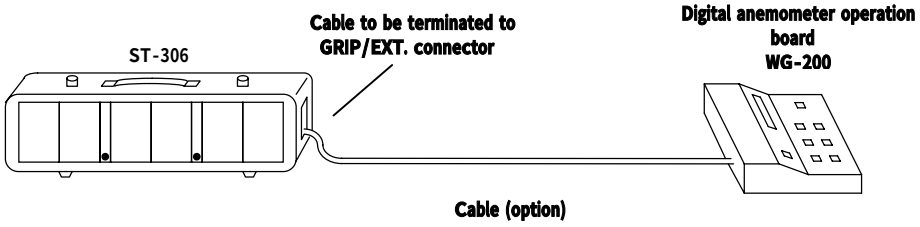
(a) Setting

[Display of wind velocity]

Set the FUNCTION switch at “82”.

Turn the POWER switch to ON.

(b) Cabling



(C) Cabling

The wind velocity is displayed.

(11) Connection with optical distance measuring equipment (DM-200)

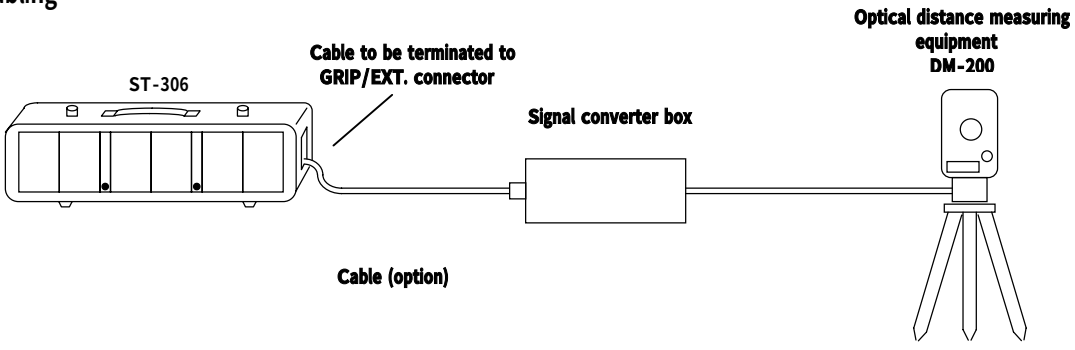
(a) Setting

[Display of distance]

Set the FUNCTION switch at “83”.

Turn the POWER switch to ON.

(b) Cabling



(c) Display data

The measured distance is displayed.

(12) Precautions on hook-up

⚠ CAUTION	Be sure to turn OFF the POWER switch before connecting and disconnecting the cable, except when operating the MODEL ST-306 connected with CT-1000/916 in the externally synchronized mode.	
	Do not use any cable other than furnished as a standard accessory or exclusive cable for use with externally connected equipment. This is important for the prevention of fire and equipment failure.	
	Do not use any cable other than furnished as a standard accessory or exclusive cable for use with externally connected equipment. This is important for the prevention of fire and equipment failure.	

LIST OF FUNCTION SWITCH SETTING AND AVAILABLE FUNCTION

Setting inhibited

Function		Upper digit 0x	1x	2x	3x	4x	5x	6x	7x	8x	9x
		Standard operation	Scoreboard mode	Connection with sports printer CT-1000/916	Connection with ski timing system CT-400/300	Connection with swimming Timing System (PT-7000/6000)	Display of split time by order of arrival PT-7000/6000 connected	Display of split time by lane with PT-7000/6000 connected	Connection with indoor sports operation board ST-2000/900/800	Connection with track event timing system	Not used
Lower digit	0	Downcounting/ upcounting, etc	Connection with ST-23	Display of running time, finish time	Display of 1st trial time and total time	Display of running time	10 place	10 lane	Display of game time	Display of running time and finish time sent from RT-120	
	1		Standard scoring mode	Synchronization of internal clock	Display of 1st and 2nd trial time	Display of running time (via SB)	1 place	1 lane	Display of scores	Display of bib numbers and lane numbers sent from RT-120	
	2		Tennis scoring mode		Display of start timer (CT-400 ONLY)	Display of running time or the lap time of 1st place	2 place	2 lane		Display of wind velocity measured by WG-200	
	3		Soft tennis scoring mode			Display of program No. and heat No. (via SB)	3 place	3 lane		Display of distance measured by DM-200	
	4		Count display mode				4 place	4 lane			
	5						5 place	5 lane			
	6						6 place	6 lane			
	7						7 place	7 lane			
	8						8 place	8 lane			
	9						9 place	9 lane			

20 OPERATIONAL PRECAUTIONS

(1) POWER switch reclosing procedure

To reclose the POWER switch after turning it OFF, be sure to provide a waiting period of more than 10 seconds.

(2) Blackout procedure

You are recommended to black out the display after use for the purpose of saving the display from fading due to burn.

The blackout procedure is as follows.

1) Turn the POWER switch to OFF.

2) Turn the POWER switch to ON.

3) When the display has been totally blacked out, turn the POWER switch to OFF immediately.

If there are some segments left on display, do over again from step 1), though the user has the option of storing the sports timer as it is because it performance will not be affected by such state.

(3) Procedure for restart after memory call

The memory can be called up after stopping or resetting the sports timer by pressing the STOP or RESET button of the grip switch.

After memory call, press the RESET button of the grip switch to initialize the memory.

Unless the RESET button is pressed, the MODEL ST-306 will not be restarted.

(4) Buzzer

When the POWER switch is turned off, the internal buzzer may beep momentarily, but this is no problem.

21 CARE AFTER USE

The sports timer, MODEL ST-306, is designed for outdoor use, but should not be left to take care of itself outdoors for an extended period.

After use, wipe clean of moisture, and stow away indoors.

⚠ CAUTION	AFTER USE, BE SURE TO REMOVE THE DRY CELLS FROM THE INSTRUMENT. FAILURE TO OBSERVE THESE PRECAUTIONS MAY LEAD TO EXPLOSION, ELECTROLYTE LEAKAGE, AND EXOTHERMIC REACTION OF DRY CELL, CAUSING INJURIES AND ENVIRONMENTAL POLLUTION.

22 SPECIFICATIONS

Power supply		"AA" dry cell x 8 pcs.
Battery service life under continuous duty※		Alkali dry cell (LR6), approx. 50 hrs. (at 25゜C) Manganese dry cell (R6PU), approx. 25 hrs. (at 25゜C)
Display		Magnetic rotary bar, yellow, character height 200mm, 6 digits
Timing accuracy		±0.04 sec./hr. (5°C ~ 35°C)
Overall dimensions		1230 mm (W) × 330 mm (H) × 150 mm (D)
Mass		12.5 kg max.
Grip switch		Cord length, 5 m; φ60; w/START/STOP and LAP/SPLIT/RESET buttons
Battery box		"AA" dry cell x 8 pcs.
Measuring function - Upcounting (stopwatch-like application): -	**Maximum measuring time**	99h59m59s (59m59s99)
	Lap time or split time	No limit to the count frequency within the maximum measuring time
	Memory and memory call Lap or split time	Count or number of measurements storable: 25 max. (Count or data in excess of 26 overflows the memory.)
	Auto repeat (REPEAT)	Automatic cyclic time counting from 0 to a preset time, and beeping of buzzer for approx. 5 sec. after every expiration of preset time.
Measuring function - Downcounting:-	**Preset time**	99h59m59s ~ 1s
	Minimum setting unit	1s
	Minimum indicating unit	1/100s (selectable by switch; blacked out during counting operation)
	Start/stop	Start/stop can be made any times within the preset time.
Operating environment	**Location**	Indoors/outdoors (provided that permanent outdoor installation is prohibited.) Although the sports timer can withstand rainwater for a short period of time, it should not be used as a permanent outdoor installation. When operating the sports timer outdoors under windy condition, provide proper measures to prevent toppling hazards.
	Temperature	0°C ~ 50°C (no dew condensation)
	Humidity	30% ~ 80% RH (no dew condensation)
Miscellaneous	Protection against dust	Display unit with a dust cover Printed circuit boards treated with a resist coating
	Protection against rain	Protected enclosure to ensure normal operation in the rain
	Operating position	Fall from perpendicular line: within 15゜ in the x-y plane (left/right direction), within 30゜ in the z-y plane (back/forth direction)
Equipment available for connection with ST-306		ST-23, PS-107/105, CT-1000/916, CT-400/300, PT-7000/6000, ST-2000/900/800 series, RT-120, WG-200, DM-200

※Typical value when operated continuously in the upcounting mode.
It should be noted that the battery service life varies dependent on the operating conditions, ST-306 parameter settings, ambient temperature and other environmental conditions

Our policy of constant product improvement may dictate changes to the specifications of ST-306 (incl. accessories) above without notice.

23 WHAT YOU NEED TO DO BEFORE CALLING A SERVICEMAN

SYMPTOM	PROBABLE CAUSE	MEASURES
Nothing appears on the display when the POWER switch is turned ON.	Battery has run out.	Check the battery and replace the dry cells if the red lamp alone lights up.
	Dry cells are set in wrong directions.	Correct the orientation of the dry cells.
ST-306 will not respond to the START/STOP switch	Malcontact failure of grip switch	Correct the connection of the grip switch connector.
	The time has not been set in DOWN or REPEAT ON mode.	Set the mode to DOWN, and press the LAP/SPLIT/RESET button
	Failure to press the SET switch after setting the initial value.	Press the SET switch after setting the time.
	In the repetitive upcounting mode, the LAP/SPLIT/RESET button was not pressed for zero resetting.	Press the START/STOP button for zero resetting.
	START/STOP button was pressed by mistake when you should press the LAP/SPLIT/RESET button.	Press the START/STOP button.
Nothing is displayed when external equipment is connected.	Malcontact failure of extension cable	Correct the cable termination.
	The FUNCTION switch setting is not in agreement with the external equipment	Correct the FUNCTION switch setting, and power up the MODEL ST-306 again.
	The FUNCTION switching was set preposterously after POWER ON.	Set the FUNCTION switch first, and then turn the POWER switch to ON.
	The DISPLAY switch is turned OFF.	Turn the DISPLAY switch to ON.
	External equipment is not functioning.	Turn on the external equipment, signal switch, etc. to send signals.