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"Hakarunjer version 3.5"

User Manual

English Translation – by Christopher R. Smith & Hideaki Yabuki

Thank you very much for choosing our "Hakarunjer v3.5" portable lap counting system. R/C users wish to track lap times without an assistant -- This has been our long-awaited dream! Finally, the solution to this dream has come true!

This system is very useful. For instance:
a) You can track lap time influences from vehicle tuning changes.
b) You can develop suitable gear ratios per track conditions.
c) You can determine where to improve your driving techniques during practice runs.

Chapter 1: Specifications

a) Counting time
This system is able to count lap times in 0.01sec units. However, an error of less than +/- 0.02sec may occur in some cases described below:
- Vehicle approach angle differences on the track.

The "Hakarunjer" lap-counting unit (receiver) uses Infrared (IR) light to communicate with the vehicle(s) transmitting unit. If a vehicle passes the counting unit on a trajectory other than moderately parallel (perpendicularly or at a slant along the track passing the receiver) an error may occur
- Environmental influences.

If the system detects an infrared ray in the ambient sunlight; or, when multiple vehicles using the system pass the counting unit (receiver) at the same time, the system may try to read a vehicle's ID number again (or the system may fail to detect a vehicle's IR signal). Also, IR reflections may cause detection errors.

b) The number of rounds
The system memory can hold lap times for up to 60 rounds after the system is powered down.

c) Measuring time
The system can measure lap times of up to 11 minutes (655.35 seconds).

d) The lap time indications
The counting unit has a Liquid Crystal Display (LCD). The LCD will display such lap time information as listed below:
- The best lap -- after a run and return to the pit.
- Every lap time per round while turning laps.
- The passage of time after a start.

e) The confirming sound
The counting unit (receiver) has a built-in buzzer. During operation and when a vehicle passes the receiver, the buzzer will sound off with a “pi-pi”. If a current lap time is faster than your “target time”, the buzzer will sound off with a "pi-pi-pi-pi" (4 times). Also, the system has a very convenient function, when a fast lap updates the “best lap”, the buzzer will sound off with a “pilo-pilo-pilo". You can roughly determine lap time progress audibly during operation with these functions.

f) Minimum lap time intervals
The system can be set up for minimum lap times of 5 seconds to 30 seconds to minimize a “fail to detect” error or a possible “double detection”. For instance, accidental vehicle spins near the receiving unit.

g) “Start” methods include two different modes:
● Stagger: When a vehicle passes the receiver on a running start, the counter will start timing automatically.
● Count Down Signal Start: The unit will sound the buzzer for every second, sound off with a louder “pi-pi-pi-piii” during the last seconds, then start the counter, for a standing start as in the usual finals.

h) The receivable distance
● In-door track locations: approximately 10 meters (32 feet).
● Out-door track locations: approximately 5 meters (16 feet) under direct sunlight.

Chapter 2: System Check

Please, check your product for accidental damage inflicted while transporting. If damage exists, please contact us.

Chapter 3: Receiver Power Conditions

● The system includes the test battery. However, it may be exhausted.
● The battery is capable of powering the unit for 2 to 3 hours of continuous use. Please, power down the unit immediately when not using the system.
● If the LCD is not clear or the system’s IR reception is down, battery replacement is recommended. **CAUTION! Do NOT change the battery while the power switch is ON! The system’s microprocessor may be damaged or worse.**
● Please, use a 9V battery with the snap terminals for proper replacement.
● Please use a new battery for this system. When an older battery is used in the receiver the system’s IR reception will be reduced, remarkably.
● The receiver can use a 7.2V Ni-Cad battery pack. However, this application will void any guarantee.

Chapter 4: Checking Receiver Operation

After a battery has been attached correctly, place the power switch in the “ON” position. When the unit is switched “ON”, the LCD will display the text below:

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ALEX RACING DES. (“Hakarunjer” is displayed in Japanese characters - Katakana)

If the LCD does not display any characters, the microprocessor may be hugged because of the “Noise” or the low voltage of the battery. In this case, please push the "RESET" button once.

(If you can not solve the problem, please contact us.)

Supplement:
There is a trimmer pot adjustment at the lower left of LCD for display contrast. NOTE: The brightness of ambient light or temperature of surroundings can affect the contrast of the LCD.

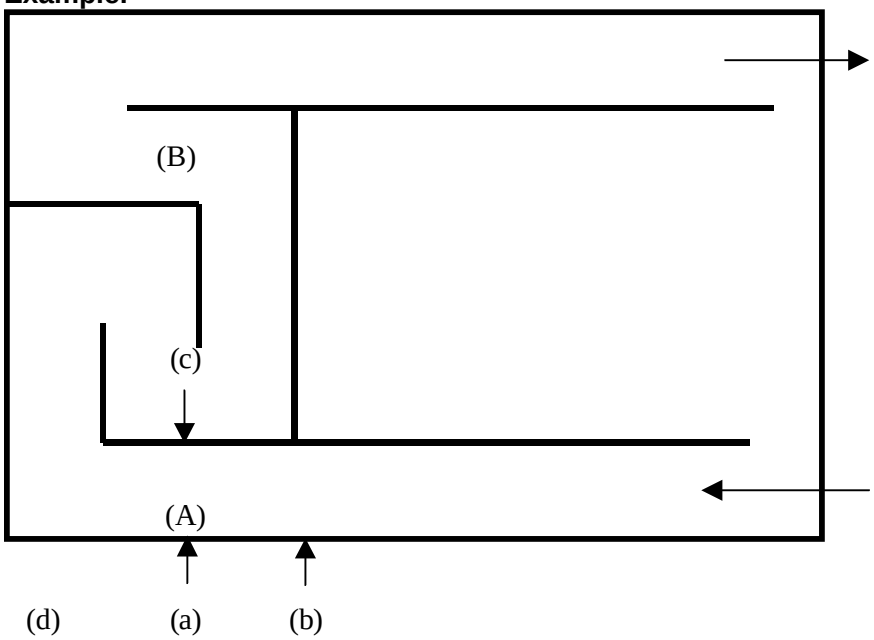
Chapter 5: Checking IR Operations of the System

● Step #1: Power “ON” the receiver.
Place the power switch in the “ON” position. For decisive operation, please push the “RESET” button.
● Step #2: Enter lap counter mode.
Push the "MENU" button until "LAP" is displayed in the LCD, then push the "ENTER" button.
● Step #3: Connect IR transmitter.
The IR transmitter has a wire with a connector. Please connect this wire into an empty channel of the radio control system’s receiver on the vehicle (or BAT terminal of EP car).
CAUTION! Do NOT do attempt reversal connections. (The transmitter does not contain polarity safety circuit.)
● Step #4: Confirmation of the signal.
Turn the transmitter towards the receiver at a distance of 5 meters (16 feet). When the buzzer sounds off with a "pi-pi", the IR system is operating and detected the signal properly. If the system does not work properly, it is caused by a wrong ID setting. Please check and set the correct ID for the transmitter unit, and try again.

Chapter 6: Positioning the Receiver at Trackside

● Trackside placement.
The receiver must be placed parallel to the track. Position the receiver unit horizontal and with the IR window facing the track in such a way as to detect IR transmissions from a passing vehicle.
● Buzzer volume.
If the buzzer is too loud, try using cellophane tape to cover the holes in the receiver unit.
Supplement:
The IR system outputs horizontally from the transmitter, an error detection from reflections may occur depending on the layout of a track and reflective objects near the receiver unit. (Especially, on in-door tracks, the occurrence rate will be higher due to the absence of interference from sunlight.) However, such errors can be minimized by changing the placement of the receiver and/or using a “MIN LAP” setting.

Example:



If you position the receiver at location (a), double detections may occur from vehicle positions (A) and (B) depending on the width of the course. In this case, reposition the receiver to location (b).
There is a possibility of detection errors at location (d) due to a vehicle's trajectory not being moderately parallel with the receiver's IR window.
If possible, to minimize detection errors and obtain the best possible parallel trajectory between system units, optimum placement may be a position such as location (c).

Chapter 7: How to Install the IR Transmitter

Install the IR transmitter unit in the place of a transponder used in the vehicle during a race. The weight of one IR transmitter unit is 20g (0.64oz). Position the IR LED at the right or left window of the vehicle to transmit toward the IR receiver unit at trackside. (An "L" shaped piece of scrap body shell can be fashioned to hold the IR LED near a window.) The IR transmitter unit does not have a power switch. So, the unit will remain ON as long as the unit is connected to the vehicle's power supply.

Chapter 8: Receiver Button Descriptions

The "Hakarunjer v3.5" system has 5 switches on the receiver faceplate.

- MENU: The "MENU" button scrolls through the functions listed below.
    - (1) LAP: Counting laps.
    - (2) DISPLAY: Reviewing lap times.
    - (3) ID: Setting the ID of a transmitter unit.
    - (4) MIN LAP: Setting the interval for a minimum lap time.
    - (5) SET LAP: Setting your target lap time.
    - (6) TIME: Setting the race time.
    - (7) MODE: Setting the race start mode.
    - (8) CALIBRA: Making revisions in the clock.

- DOWN: Decrement numbers. Scroll lap times.
- UP: Increment numbers. Scroll lap times.
- ENTER: For determination. Starting a countdown.
- RESET: Microprocessor Reset. Stops counting.

Chapter 9: How to Operate the Receiver.

LAP:

When you push "ENTER", then lap counter starts.

- In “STAGGER” start mode: When a vehicle passes the receiver on a running start, the counter will start timing automatically.
- In a Count Down signal start mode: “DOWN20s”, after the sounds for 20 seconds, the counter will start. (see “MODE” description below for setting details)

If you wish to stop counting laps, press "RESET". The system memory can hold lap times for up to 60 rounds after the system is powered down.
You can use a hidden command by holding the "DOWN" button and pressing the "ENTER" button. This is the lap conceal mode. This mode is useful if you would like to hide your times from the people nearby.
Also, if you press the "ENTER" button after starting a lap count, the receiver can be used as a stopwatch. You can count laps manually by pressing the “ENTER” button. This function can be used when operating a vehicle without an IR transmitter.

DISPLAY:
When you press "ENTER", the LCD shows the lap times recorded in the system’s memory. First, the best lap time is shown. Pressing the "UP" and "DOWN" buttons will show all lap times up to final round recorded.

ID:
You can set the transmitter’s ID number by pressing "UP" and "DOWN" buttons. The ranges are from #1 to #100.

MIN LAP:
You can set the interval for a minimum lap time (in seconds) by pressing the "UP" and "DOWN" buttons. The ranges are from 5 to 30 seconds.
The interval of the minimum lap time is the minimum time between detections, the system never detects within this time. For example, if one lap of the track takes 15 seconds, then it would be best to set the “MIN LAP” to about 13 seconds. This minimizes double detections during an accidental vehicle spin in front of the receiver unit and other detection errors.

SET LAP:
You can set your target lap time (seconds) by pressing the "UP" and "DOWN" buttons. The ranges are from 5.0 to 30.0 seconds in 0.1 second units. If a current lap time is faster than your target time, the buzzer will sound off with a "pi-pi-pi-pi" (4 times). Otherwise, the buzzer will sound off with a "pi-pi". You can roughly determine lap time progress audibly during operation with this function.

TIME:
You can set the race time (minutes) by pressing the "UP" and "DOWN" buttons. The ranges are from 1 to 10 minutes. The buzzer will sound off and inform the finish of the race when the vehicle passes the receiver after the race time setting has elapsed. The counter will be stop at this time.

MODE:
You can set the race mode by pressing the "UP" and "DOWN" buttons.

- Stagger: When a vehicle passes the receiver on a running start, the counter will start timing automatically.
- Count Down Signal Start: The unit will sound the buzzer for every second, sound off with a louder “pi-pi-pi-piii” during the last seconds, then start the counter (as in standing starts usually in the finals). The unit can be set to: “DOWN10s” 10 second countdown, “DOWN20s” 20 second countdown, and “DOWN30s” 30 second countdown.

CALIBRA(TION):
You can calibrate the clock by pressing the "UP" and "DOWN" buttons. The ranges are from 1 to 10. Default is 5. Decreasing the numbers makes the clock count time faster. Please, adjust the number when you acquire the system due to the differences in the chips used.

Chapter 10: The Warranty

6 month limited warranty. ALEX Racing Design will, at our option, repair or replace any unit found defective in manufacture within the warranty period. The warranty period is determined by the date of purchase. Keep the receipt as proof of purchase. Otherwise, the warranty period is determined by the date of manufacture. **This warranty does not apply to damage caused by accident, misuse or tampering, and excludes all consequential damage except in jurisdictions not allowing such exclusions or limitations.**

Chapter 11: An Afterword

We welcome your reports and we request your ideas and wishes for any new functions you may have for our system. Thank you very much.

Chapter 12: Contacting Us

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