XT RACING

Ultra-Lap User's Guide

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Chapter

1

Introduction

This User's Guide provides you with all of the information you need to use and maintain your Ultra-Lap lap-timer. This guide will tell you:

- How to quickly start using your Ultra-Lap

- Detailed information on the operation of the Ultra-Lap receiver

- Detailed information on the operation of the Ultra-Lap transmitter

- Troubleshooting and hints

ICON KEY
Ⓜ Menu
↻ Move Left
↺ Move Right
Ⓢ Select

The Ultra-Lap uses a consistent, simple 4-button user interface; and throughout the manual these buttons will be in icon form. The symbols for the buttons are shown in the Icon Key table.

You'll notice that the User's Manual is not very long; that's because we expect that the operation of the Ultra-Lap will be very intuitive. You should just be able to pick it up and go.

Quick Start

1. To set the date and time go into the menu system (press Ⓜ), navigate to menu item 9 (using ↻ or ↺), then hit Ⓢ. The month will be blinking. Use ↻ and/or ↺ to change to the correct month and press Ⓢ to move to the next field. Now the day will be blinking, change it with ↻ and/or ↺, and press Ⓢ. Now continue by changing the year, hour, minute and second similarly. When done, press Ⓜ to set the date and time.

2. Mount the receiver (the box with the display) in a spot where you can glance down and see it while racing. Attach it with Dual-Lock, electrical tape, duct tape, or a tie wrap. Make sure it is secure. Dual-Lock, unlike Velcro, does not come in two different (hook & loop) materials. It attaches to itself

3. Mount the infrared pickup module to one side of the vehicle (see mounting tutorial on page 13) – so that when you ride by the transmitter beacon, the little window is pointing directly at it. Again, use Velcro or tape. Make sure it will have an unobstructed direct line-of-sight to the transmitter when you pass it. (Examples are available on our website, www.xtracing.com)

4. Either power the transmitter with a 12V lead-acid battery (using the cable supplied), or insert 4 AA alkaline batteries (not supplied) into the transmitter battery holder. Connect the red alligator lead to the "+" battery terminal, and the black alligator lead to the "-" battery terminal. Powering off a 12V battery is preferred, as you will get <u>much</u> longer battery life, and the device will transmit with much more power.

5. Mount the transmitter on a tripod directly facing across the width of the track. This needs to be at a place where the IR receiver mounted on your vehicle will have a straight, unobstructed line of sight with it. Turns, especially ones which are banked, are not the best place to place your transmitter.

6. Start racing!

7. Each time you pass the transmitter, another lap will start. At the end of each lap, the lap time will be displayed (frozen) on the screen for a set amount of time (Menu #5 on the timer).

8. When the race is over, press any button to review your laps.

Chapter

2

The Receiver

The Ultra-Lap receiver is the part of the Ultra-Lap system that is placed on your vehicle. It is the piece that you interact with. This chapter will describe all of the options the receiver has and how to use them most effectively.

Turning on the Receiver

You can turn on the Ultra-Lap by pressing any button and holding it for one second. The Ultra-Lap can also automatically turn on (depending on a user-customizable setting in Menu #12) by passing a transmitter. This prevents you from missing a session if you forgot to turn the receiver on before a race.

Turning off the Receiver

The Ultra-Lap will automatically turn off under control of the auto power down feature (depending on a user customizable setting in Menu #13). There is no way to manually turn the receiver off (except, of course, by taking out the battery).

The Main Screen

Figure 1   The main screen.

The main screen that appears when the Ultra-Lap is turned on is the center of the Ultra-Lap's user-interface. Most commands issued to the Ultra-Lap will begin from this screen. This screen displays the date/time, the device's personalization information, the current temperature, percentage of free storage (for storing laps and split-times), and a battery-level indicator.

The main screen can be accessed from any other screen by pressing Ⓜ once or *TWICE* (depending on where you are). From the main screen, press Ⓜ once to enter the menu system, or press ⊂ or ⊃ to enter the lap review system.

The date/time is always changing so you can tell if the device is "alive." The personalization information is also displayed on this screen so if someone finds your unit they can easily identify your device (how to set this information is described below).

Temperature indicator

The Ultra-Lap always shows the current temperature on the main screen. You can select Fahrenheit or Celsius via Menu #15 (described later). Please note that the temperature sensor is inside the enclosure and readings can vary depending on air circulation, whether or not it is in direct sunlight, etc.

Free-storage indicator

The free-storage indicator shows what percentage of lap/split space is currently unused. When the storage becomes full, the oldest laps will be overwritten, so you never lose your most recent times.

Battery-level indicator

When the battery symbol in the lower-right corner is all black, your batteries are at full voltage. When the battery indicator goes "empty" it is time to replace the batteries. Note that replacing the battery does not affect in any way any of the stored laps in the Ultra-lap; all your stored laps and all current menu settings are retained.

The Lap Review System

Figure 2   The lap review screen.

The Lap Review System is the place where you can access all of your lap times.

The information displayed for each lap is as follows:

- First line: the Track ID for the lap

- Second line: date and time of the lap

- Third line (on the left): the session ID (used to indicate which laps are in the same session or race)

- Fourth line (on the left): the lap number within that session or race

- Large digits on the right: the lap time

- A "*" to the right of the lap time: this will appear if the displayed lap was the fastest lap of that session or race

- Optional "S" to the right of the lap time: this indicated that the time shown is a split time (partial lap)

Whenever a lap from memory is displayed, ↻ displays the lap stored before this lap (the previous lap), and ↺ displays the lap stored after this lap. If there are no previous or next laps, "No More Laps" is displayed and the display reverts to the lap just displayed. To exit out of the Lap Review System, press Ⓜ.

The summary screen
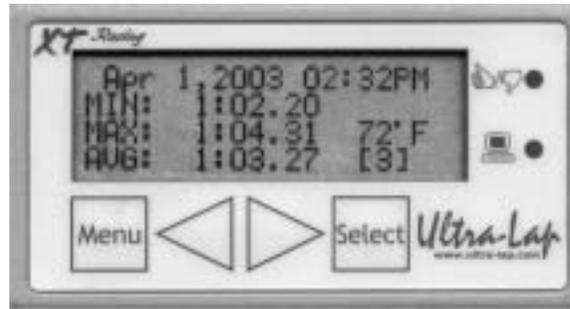
Figure 3   The summary screen.

At the end of each session, a summary screen is displayed. The statistics displayed in the summary screen are computed from the previous session, and by using Menu #16 you can exclude the first lap of the session from the average lap time. The summary screen displays the following information:

▪   Date and time of the beginning of the session

▪   Minimum lap time

▪   Maximum lap time

▪   Average temperature during the session

▪   Average lap time for the session

▪   Number of laps (the number inside the brackets)

What is "SID," that I see in the lap display?

The SID (session I.D.) is a number that increments for each race or practice session run. Every lap within a given race will have the same SID while each race or practice session will have its own, individual SID. This makes it easy to see which laps were within one race and also allows you to compare your performance on the same laps from different races.

The Trigger

A "trigger" is when the receiver either starts counting a lap-time or stops the current lap-time and starts a new lap. A trigger should only happen when the receiver passes by the transmitter's infrared beam (when the transmitter is set to "start/finish" mode). With the Ultra-Lap you never have to worry about missing lap-times because no matter what screen the Ultra-Lap is on a trigger will cause the lap-timer to start. In addition, with the automatic-turn-on option enabled (which we recommend) even if the Ultra-Lap is off (nothing displayed on the screen) a trigger will cause it to turn on and start counting a lap. So you will never miss a session of lap-times because you forgot to turn your lap-timer on.

There are cases where you could miss a trigger when you pass by the transmitter beacon. One common reason is that another vehicle is in the path between you and the transmitter. This could cause you to miss a trigger, but in most cases the receiver will still pick up the beam (because the infrared bounces around the other racer). Another common reason for missed lap triggers is improper mounting of the infrared "IR" receiver. It is important to note that the IR receiver needs to have a direct and straight line of sight to the transmitter in order to assure that accurate triggering will occur for each lap.

Mounting

Mounting can be the trickiest part of using the Ultra-Lap especially with vehicles that do not maintain a static height during a race, but keeping these tips in mind should make the process easier.

1. The IR receiver on the Ultra-Lap needs to have as straight and direct a line of sight with the transmitter as is possible. The receiver "eye" should be at the edge of the vehicle and not buried inside in any way. It needs a clear and wide view toward the transmitter.

Good mounting near edge of the vehicle; clear and wide view toward the transmitter when the vehicle passes.

Good mounting on the tail section; clear and wide view toward the transmitter when the vehicle passes.

Poor mounting — although the Ultra-Lap is pointing toward the transmitter when vehicle passes, the receiver is too far "inside" the bike and does not have a wide view toward the transmitter.

2. The transmitter and the receiver "eye" should be approximately pointing at each other when the vehicle passes by the transmitter. If, for example, the transmitter is placed on a banked turn where the vehicle passing it will be tilted at an angle, the alignment will not be good and the trigger will not occur. The receiver "eye" should point either directly at the transmitter or slightly down (down if the IR receiver is pointing at the transmitter with the silver plate facing downwards)
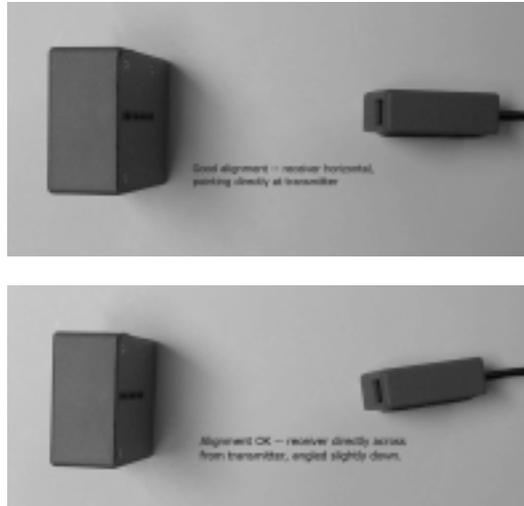
3. Do not mount the IR receiver so that it is pointing through clear plastic or a safety-glass window as these are frequently made to filter out UV rays from the sun and may actually interfere with the transmitter's signal.
4. The Ultra-Lap transmitter puts out a stronger signal when running off a well charged, external 12V lead-acid battery. A good, sealed battery we've found is from www.batterymart.com part number SLA-12V7-F1. On a full charge, this battery will power a transmitter for several weekends before it needs to be recharged.
5. Make sure there are not two transmitters anywhere near each other at the start/finish line. Two transmitters near each other can cancel each other out and will cause not only you, but everyone else at the track to miss their lap times.
6. The minimum lap time setting in the Ultra-Lap must be safely under the lap time that you will be running. The factory default setting is 50 seconds and generally works fine.
7. The maximum lap time setting should be set safely over the lap time that you will be running. Leave it at the default of 15 minutes 59 seconds unless you have a specific reason for changing it.
8. If you will be passing the transmitter at high speed (approximately 100 mph or more) the transmitter should not be closer than 15' from where you will be passing the transmitter. If you closely pass the transmitter at high speed, the signal may not be picked up.
9. With an external 12V battery, the transmitter should easily be able to trigger a receiver passing at 200 mph at a distance of up to 80'.

The Lap Spinner

Figure 4   The lap spinner.

The lap spinner is the screen that is displayed while you are racing. The receiver will automatically go to this screen when it receives a trigger. This display shows the counting time while you race around the track and holds on the previous lap-time when you pass by the transmitter beacon for a predetermined period of time. The lap-time hold allows you to look at your previous lap-time while you are racing and can be set in Menu #5.

The small number in the upper-left corner of this screen is the optional lap counter. The lap-counter system is controlled by Menu #1 and Menu #2.

Split Times

The Ultra-Lap can record split times (intermediate timings) as well as regular lap times. In order to record split times, several Ultra-Lap transmitters (more than 1) need to be placed around the track. It is important to note that during any race, that ONLY ONE transmitter should be placed at the start/finish line and should be set in "start/finish" mode. Having more than one transmitter at the start/finish line will mix the signals and can cause everyone on the track using a timer to miss their lap triggers! Any other transmitters placed around the track should be set to "split" mode. These "split" transmitters will cause your lap timer (and any other Ultra-Lap timers set to record splits) to record intermediate split times. You will not see these split times on the display while you are racing, but they are being recorded.

Split times are useful for gauging how you are doing at various parts of the track. For example, you could place split transmitters before and after a series of hard turns and compare how you do in those turns.

You can place any number of split transmitters on the side of the track, as long as they are spaced at least 2 seconds of ride time apart.

Split times are displayed with an "S" in the lower-right corner of the Lap Review screen. Split times do not affect the minimum, maximum or average lap times shown on the summary screen.

The Menu System

The menu system allows you to control all of characteristics of the Ultra-Lap. The menu system can be accessed at any time by pressing Ⓜ; unless you are already in the menu system, then pressing Ⓜ will take you back to the main screen.

Figure 5   Sample menu.

There are 24 menus in the Ultra-Lap. When you go in to enter the menu system by pressing Ⓜ, the last menu item you were in is brought up. The screen will display a left arrow and/or a right arrow for navigation to other menu options. ↺ moves to the previous menu option; ↻ moves to the next menu option.
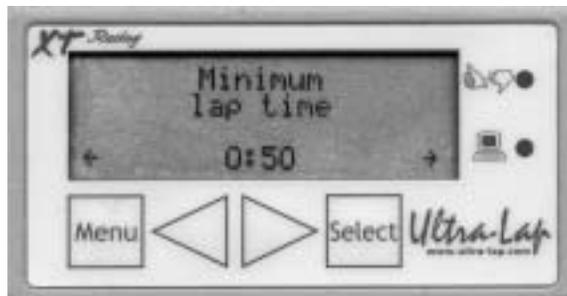
Figure 6   Activated minimum lap-time menu.

If you want to activate that menu item (i.e., examine the current value and possibly change it), press 🅢. This will display the current value for that menu item. A left and/or right arrow will be displayed, showing the bounds for the current menu option.

Now, using ⟲ and ⟳ you can navigate through the possible options. To confirm the changes you have made, press 🅢 and the change will be made, plus you will be returned to the menu navigator. If you change your mind and do not want to make a change to a menu value, press Ⓜ and it will cancel the change you made and bring you back to the main screen.

 The menu items are as follows:

Number	Menu Item	Description
1	Count laps	Enables/disables lap counter and counts up or down
2	Set number of laps per session	Displays optional down-count of laps to go during race
3	Minimum lap time	Sets minimum lap time
4	Maximum lap time	Sets maximum lap time
5	Hold time at end of each lap	How long the completed lap time is displayed at the end of each lap
6	Select track names	Select a track name from the stored list
7	Enter track or ID	Sets the track name stored with each lap
8	Go to a race or session	Jumps to the first stored lap on a given day
9	Set date and time	Sets current date/time
10	Adjust contrast	Adjusts contrast of the LCD display
11	Capture split times	Sets whether or not split-times should be collected
12	Enable or disable automatic turn on	Controls auto-turn-on feature
13	Number of minutes until auto power off	How long the Ultra-Lap stays powered on
14	Which lap to display after race	Selects first, best, or last lap to display at end of race

15	Temperature units	Select Fahrenheit or Celsius
16	Ignore 1st lap in averages	Tells if the session summary lap average include the 1st lap
17	Lap flash	Controls blink feature at completion of each lap
18	Personalization line 1	For entering owner information
19	Personalization line 2	For entering owner information
20	Transfer all laps to PC	Sends all data to PC (via optional cable)
21	Delete last viewed race or session	Deletes one session from memory
22	Delete all laps from memory	Deletes all laps
23	Clear list of track names	Clears the stores list of track names
24	Factory reset	Resets the Ultra-Lap to the settings it had when manufactured. CAUTION: in addition to resetting all the setting changes you may have made, *ALL STORED LAPS AND TRACK NAMES WILL BE DELETED*

Description of Menu Items

Menu 1 – Count laps
This option allows you to select whether or not laps will be counted, and, if so, whether the counter will increase or decrease for each lap. If you select "do not count laps," then the lap counter will not be displayed. If you select "count down," the counter (specified in Menu #2) will decrease by one for each lap; if you select "count up," the counter will increase by one for each lap. You might use count-down if you are in a race with a fixed number of laps, and you might use count-up to keep track of how many laps you have completed in a practice session or endurance race.

Menu 2 – Set number of laps per session
If you are counting laps with the Menu #1 option enabled, this specifies how many laps there are in a race. The Ultra-Lap will display the lap number up to the end of the last lap of the session, but will continue logging lap numbers for lap review after the race. The Ultra-Lap will count up or down a maximum of 99 laps; however, the Ultra-Lap will continue to store laps in the session, to a maximum of 255 stored laps.

Menu 3 – Minimum lap time
You might normally set this option to a few seconds less than your typical lap time for the track at which you are racing. When you set the minimum lap time, any infrared beacon pulses (or extraneous I/R background noise) that occur before this time are ignored. You <u>can</u> set this number to the minimum (2 seconds) and generally the Ultra-Lap will record your laps properly. This option is set in minutes and seconds.

Menu 4 – Maximum lap time
You might normally set this option to a few seconds more than your typical lap time. Here is an example where this might be useful: Let's say the transmitter is positioned at the start/finish line. Your starting position is of course somewhat behind the start/finish line. When you first cross the beacon, the timer will start your first lap, but since you may not be going full speed, your first lap will be a few seconds slower than your other laps. By setting the maximum lap time, you can have the device ignore and not store that lap. To turn off the maximum lap time feature and therefore store all laps, set this time to 15:59

(minutes:seconds). Note that when the maximum time has occurred, the word "MAX" will display on the LCD instead of the current lap time, until the next lap is started by crossing the beacon path.

Note: good choices of minimum and maximum lap times will also minimize the possibility of a "false trigger". The Ultra-Lap triggers off infrared signals. Even though it is highly immune to infrared radiation that is from other sources than the transmitter, the sun itself is a major source of infrared radiation, so it is possible but not likely that a false trigger can result. Since all infrared is completely ignored before the minimum lap time and after the maximum lap timer, setting these appropriately can reduce the incidence of false triggers if they occur.

Menu 5 – Hold time at end of each lap
This specifies how long, in minutes and seconds, to "hold" the lap time at the end of each lap. For example, you might set this for 20 seconds, and then at the end of each lap, the lap time will be displayed on the LCD for that long.

Menu 6 – Select track name
Whenever you enter a track name in Menu #7, you have the option of storing that track name in the track-name list. Use this option to set the track name, quickly, by picking it from the list of track names you have previously entered.

Menu 7 – Enter Track or ID
This lets you set the track or other identification for storing with each lap. When you press 🅢, it will display the current ID, if any. The character you are currently modifying is the one that is blinking. Use 🄲 or 🄳 to cycle through the letters, numbers, space, and the back-arrow. Press 🅢 to choose that character and move to the next position. Pressing 🅢 when the back-arrow is showing allows you to backspace to the previous position. Press 🅜 when you are done. At this point, you have the option of saving the track name you just entered in the track-name list (see Menu #6). Up to 20 track names can be stored in the Ultra-Lap.

Menu 8 – Go to a race or session
This option allows you to go quickly to the stored lap for a given day, as opposed to cycling through all the laps in the lap display mode. Initially, today's date will be displayed, with the month blinking. To select a different month, use 🄲 or 🄳, and 🅢 to move to the day selection. Again, select the day with the arrows, and press 🅢 to go to the year selection. When the date is correct, press 🅜 and it will go to the first race on that date or later.

Menu 9 – Set date and time
This menu is used to set the date and time for the device. The blinking field can be changed with 🄲 or 🄳. Then proceed to the next field with the SELECT button. When the date and time is correct, press 🅜 to make that date and time current.

Menu 10 – Adjust contrast
The contrast of the LCD is changed with this menu item. You may need to change the contrast somewhat for best visibility if you change the angle at which you view the display or if the ambient temperature changes significantly.

Menu 11 – Capture split times
This menu allows you to enable or disable the capturing of split times. You should turn this option off unless you want to capture split times in order to save battery power.

Menu 12 – Enable or disable automatic turn on
When this feature is enabled, you do not have to remember to turn on the Ultra-Lap. It will automatically turn on and start recording laps as soon as you cross the transmitter beacon. When disabled, the Ultra-Lap will only turn on when you press a button. Note that the Ultra-Lap uses a little more power when this feature is enabled and the batteries may not last as long as when this feature is disabled.

Menu 13 – Number of minutes until auto power off
The device turns off this many minutes after any button is pressed or lap is stored. Setting this number smaller will prolong battery life. You can set it quite small (just a couple of minutes) to save battery power, and not have to worry about forgetting to turn it on if Menu #12 is enabled (see above).

Menu 14 – Which lap to display after race
When a race is over, pressing any key brings you to the stored lap display mode. At the end of the race, the lap that is displayed is either the first lap of the race, the best lap of the race (with an asterisk '*'), the last lap of the race, or the summary screen, depending on this option.

Menu 15 – Temperature units
This option allows you to select the temperature units, either Fahrenheit or Celsius.

Menu 16 – Ignore 1st lap in averages
When computing the average lap time in the summary screen, you can decide if the lap average should include or exclude the first lap of the session. You might want to exclude the first lap since for many transmitter setups; you are not going full speed when you first cross the transmitter beam, so your first lap will generally be slower than the succeeding laps.

Menu 17 – Lap flash
If enabled, at the end of each lap, and for as long as the lap hold time (see Menu #5), the little window next to the thumbs up/down graphic will flash if the current lap time is faster than the previous. No blinking occurs at the end of the first lap of the race since there is no previous lap to compare it to.

Menu 18 – Personalization line 1
Menu 19 – Personalization line 2
These options allow you to select the two lines that get displayed on the main screen when the Ultra-Lap powers up, or when you hit MENU to exit out of the menu system. Select the text in the same manner as described under Menu #7. The text that is entered will be centered on the main screen.

Menu 20 – Transfer all laps to PC
Pressing Ⓢ transfers all the stored laps to a Windows PC via the optional PC Download Cable. It does not delete or otherwise affect any stored data in the Ultra-Lap.

Menu 21 – Delete last viewed race or session
Pressing Ⓢ here will delete the all the laps in the race that was last displayed in lap mode display. You will be asked to confirm the deletion – the date of the race and the track ID will be displayed on the confirmation screen.

Menu 22 – Delete all laps from memory
Pressing Ⓢ here will ask for a confirmation to delete all the stored laps in the Ultra-Lap. Once deleted, the stored data cannot be recovered.

Menu 23 – Clear list of track names
Pressing Ⓢ here will clear the list of track names stored in the Ultra-Lap.

Menu 24 – Reset all parameters to factory default
Pressing Ⓢ here will ask for a confirmation to reset the device to the state it was when you received it. In addition to resetting all menu parameters to their default state, all stored laps and all track names will also be deleted.

How-To

Change the battery

To replace the battery in the receiver, unscrew the screw on the back cover of the infrared pickup module and remove it. Carefully remove the battery. It is easiest to remove it by taking a small flat-tip screwdriver and carefully prying the battery out of the holder.

When replacing the battery, make sure that the battery is inserted with the correct polarity (+ and -). After replacing the battery, press and hold Ⓜ and Ⓢ simultaneously for one second to reset the Ultra-Lap.

All laps and settings are retained when you change the battery, no matter how long the battery is removed.

We recommend using only alkaline batteries for the Ultra-Lap receiver. Rechargeable batteries (both NiMH and Nicad) do contain a lot of power; however, they lose a significant portion of their power from sitting around unused. You could find out that after putting in a newly charged battery it will work great for the first weekend of racing, but after three weeks sitting in your trailer it will not work at all for the next race.

Delete a session

Display any lap from the session you wish to delete. Press Ⓜ. Select Menu #21, "Delete last viewed race or session." Press Ⓢ to invoke that menu, "No" will be displayed. If you really want to delete that SID, press ⮂ to bring up "Yes" and then Ⓢ to delete that session.

View your laps

Go to the main screen. If you then press ⮀, the first lap in memory will be displayed. If you press ⮂, the summary of your last race will be displayed.

Troubleshooting

The receiver doesn't turn on

Normally, you turn on the Ultra-lap by pressing and holding any key for one second. If nothing happens when you press any key, first try "resetting" the device by pressing and holding Ⓜ and Ⓢ simultaneously for one second. If this does not properly reset the device, the battery is dead and should be replaced. After replacing the battery, reset the device by pressing and holding Ⓜ and Ⓢ simultaneously for one second.

There are trigger problems

Check the following items:

- Make sure the receiver and transmitter batteries are not dead.

- Make sure the transmitter is at least 15' away and no more than 75' from the path where the vehicle crosses the infrared beam.

- Make sure the transmitter is pointing horizontally across the track, not pointing up or down.

- Make sure the infrared pickup module is mounted on the proper side of the vehicle so that when it passes the transmitter, it is pointing directly at it.

- For motorcycles, make sure that the transmitter is placed along the side of the track at a place where the bikes going past it will be upright.

Again, it *is* possible, but not likely, that you can miss a trigger because another racer is completely blocking the infrared beam. The infrared bounces off most surfaces, so even though you are obscured there is a good chance that you will get a proper trigger.

Hints

- The device is "always ready" for racing. No matter what is currently on the screen, when you cross the transmitter beacon, your lap will start counting.

- For normal operation, there should be only one trackside transmitter at the track set in the start/finish mode. You may put several additional Ultra-Lap transmitters around the track set in "split" mode.