

# GIROZ

## Heat Manager

### gzround v1.0.0

Ángel Herranz

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#### Abstract

Something that RC car racers miss is a reliable automatic lap counting system. Commercial transponder based systems are unaffordable for the ordinary racers and clubs.

GIROZ is an infrared transponder based system, with a maximum of 24 transponders. Models run under a detector bridge and no opaque object must interrupt the light between transponder and receptor in the bridge. Transponder consumption is less than 10mA while 2.4V is enough to detect the model (specifically design for MiniZ).

Communication with a lap counter software system is implemented through the parallel port and a sampling software module design for the system.

This document contains the user manual of several programs that allow the user to manage several heats.

## Contents

<b>1</b>	<b>Pre-requisites</b>	<b>3</b>
<b>2</b>	<b>Installation</b>	<b>3</b>
<b>3</b>	<b>Suite gzround</b>	<b>5</b>
3.1	gztest . . . . .	5
3.2	gzround . . . . .	5
3.3	gzclas . . . . .	7
<b>4</b>	<b>GNU Free Documentation License</b>	<b>10</b>

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## 1 Pre-requisites

**Personal computer: x386.** This software has been tested in Intel Pentium II, Pentium III, Pentium IV<sup>1</sup> and AMD Athlon with **parallel port**. Memory capacity will depends in the Operating System distribution. Hard disk is not necessary because a Live CD can be used. Nevertheless, any external storage will be needed to save race information (*floppy, pen drive, etc.*).

**Operating System: GNU/Linux.** The software has been tested in several GNU/Linux distribution: Debian (<http://www.debian.org>), Slax (<http://www.slax.org>), Ubuntu (<http://www.ubuntu.com>), Fedora (<http://fedora.redhat.com>), Redhat (<http://www.redhat.com>) y Suse (<http://www.suse.com>). **Debian** or **Ubuntu** are recommended in installed systems and **Slax** as a *live* distribution.

## 2 Installation

You can install this software in two ways: download binaries from <http://www.giroz.net> and installing them directly or download sources from <http://www.giroz.net> and compile the whole suite. Superuser (*root*) privileges will be needed.

### Installation of binaries

Download compressed file (*zip*) with the programs gztest, gzround and gzclas, and run the installer program install-giroz as *root* in a terminal/console<sup>2</sup>:

```
herranz:/tmp # whoami
root
herranz:/tmp # ls -al gzround*
-rw-r--r-- 1 root root 193011 2006-09-07 17:27 gzround-bin-1.0.0.zip
herranz:/tmp # unzip gzround-bin-1.0.0.zip
Archive:  gzround-bin-1.0.0.zip
  inflating: gztest
  inflating: gzround
  inflating: gzclas
  inflating: INSTALL
  inflating: README
  inflating: install-gzround
  inflating: gzround.pdf
  inflating: heat.cfg
  inflating: es.gmo
herranz:/tmp # ./install-gzround
Installing GiroZ programs... done.
root@herranz:/tmp #
```

### Compilation of sources

Download sources of the GIROZ library (gzlib) and gzround. To compile and install the library and programs you must log in as superuser in the system. We recommend you to follow this steps:

1. **Open a shell.** you can do this in several ways: (a) log in as root using a tty console (Ctrl-Alt-F1, and Ctrl-Alt-F7 to go back to the graphics interface), (b) opening a terminal using the menus in your window manager and looking for an entry Root Terminal, (c) run a

---

<sup>1</sup>Problems where detected in some units with Celeron inside.

<sup>2</sup>See how to "Open a shell" in section "Compilation of sources"

terminal or console from the menu (gnome-terminal, kterm, xterm, etc.) and become root with the following command:

```
angel@herranz:~$ su -
Password:
herranz:/tmp #
```

2. Check you are root and compressed files are in the directory (**/usr/local/src** is suggested to be used):

```
herranz:/usr/local/src # whoami
root
herranz:/usr/local/src # ls -al gz*
-rw-r--r-- 1 root root 333544 2006-09-07 17:32 gzlib-5.0.1.tar.gz
-rw-r--r-- 1 root root 504405 2006-09-07 17:33 gzround-1.0.0.tar.gz
herranz:/usr/local/src #
```

3. Uncompress both files:

```
herranz:/usr/local/src# tar xzf gzlib-5.0.1.tar.gz
herranz:/usr/local/src# tar xzf gzround-1.0.0.tar.gz
```

4. Change current directory to **gzlib-5.0.1**:

```
herranz:/usr/local/src# cd gzlib-5.0.1
herranz:/usr/local/src/gzlib-5.0.1#
```

5. Run the following commands:

```
herranz:/usr/local/src/gzlib-0.1.2# ./configure; make install
checking for a BSD-compatible install... /usr/bin/install -c
checking whether build environment is sane... yes
[...]
make[1]: se sale del directorio `/usr/local/src/gzlib-5.0.1'
herranz:/usr/local/src/gzlib-5.0.1 #
```

6. Repeat steps for directory **gzround-1.0.0**.

## Check

Finally let us check software has been installed. Log in as a regular user and run program gzround. This is the result:

```
angel@herranz:~$ gzround
GiroZ Round Manager 1.0.0 (GiroZ Library 5.0.1)
```

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warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

Usage: gzround <heat configuration file> <leg result file> (to start next leg)  
or: gzround (to see this help)

### 3 Suite gzround

GIROZ is based on the digital processing of the signals of transponder received and processed by the bridge. The suite is composed of the programs `gztest`, `gzround` y `gzclas`

#### 3.1 gztest

`gztest` checks the quality of the signal of transponders under the bridge. You can check that transponders work correctly before starting the race.

#### 3.2 gzround

You can manage several heats with `gzround`. To run `gzround` you can use the following syntax in the command line:

```
angel@herranz:~$ gzround heat1.cfg heat1-leg2.txt
```

`heat1.cfg` is a file that contains the heat configuration (duration, drivers and cars, transponders, minimum time per lap, etc.). You can edit the file with any **plain/text editor** (`vi`, `emacs`, `xedit`, `gedit`, `kedit`, etc.). The execution above will store race information in the file `heat1-leg2.txt`. Furthermore, the program will generate system events, live classification information and a lot of information on detections, timing, etc.

Let us see **an example of the content of a heat configuration file**:

`description:` This is a race configuration example

`comment:` line starting with the label "`description:`" contains a string  
`comment:` with the description of the race. Less than 80 characters.

`comment:` lines starting with the label "`comment:`" are comments about the  
`comment:` race (event, date, track, etc.). Less than 80 characters.

`comment:` lines starting with the label "`lemans:`" indicates the type of  
`comment:` start with an integer number (0 = stopped, 1 = lemans)

`comment:` lines starting with the labels "`duration:`" and "`min_lap_time:`"  
`comment:` contain, respectively, an integer number representing the race  
`comment:` duration (in minutes) and an integer number representing  
`comment:` minimum time per lap (in seconds).

`comment:` line starting with the label "`cars:`" contains an integer number  
`comment:` representing the number of cars participating in the race and  
`comment:` must appear before any other line starting with the label  
`comment:` "`car:`"

`comment:` lines starting with the label "`car:`" contains the car  
`comment:` information: car number, transponder identifier and driver name.  
`comment:` At least n car information pieces must appear being n the  
`comment:` number indicated with the label "`cars:`".

`lemans:` 0

`duration:` 1

`min_lap_time:` 10

cars: 10

```
car: 1 12 ALO Fernando Alonso
car: 2 9 FIS J. Carlo Fisichella
car: 3 11 MSC Michael Schumacher
car: 4 23 BAR Ruben Barrichello
car: 5 4 RAI Kimmi Raikonen
car: 6 18 MON J. Pablo Montoya
car: 7 22 BUT Jason Button
car: 8 1 WEB Mark Weber
car: 9 25 TRU Jarno Trulli
car: 0 16 VIL Jacques Villeneuve
```

After its execution, gzround generates a file with the race lap detections, one event per line. Each line contains information with the car number, driver, driver's lap, total race time, last lap time, information about the automatic detection or manual introduction of the lap event, and very useful information about possible problems in the detection: too long lap (?), best driver's lap until that lap (+), best race lap until that lap (\*). All the fields separated by tabs. A line with -1 indicates that race has finished and classification follows. Let us show the example heat1-leg2.txt:

7	BUT	Jason Button	1	00:00:10.54	00:10.54	*A	Pos 1
1	ALO	Fernando Alonso	1	00:00:11.06	00:11.06	+A	Pos 2
6	MON	J. Pablo Montoy	1	00:00:11.39	00:11.39	+A	Pos 3
4	BAR	Ruben Barrichel	1	00:00:11.60	00:11.60	+A	Pos 4
2	FIS	J. Carlo Fisich	1	00:00:11.70	00:11.70	+A	Pos 5
5	RAI	Kimmi Raikonen	1	00:00:11.97	00:11.97	+A	Pos 6
0	VIL	Jacques Villene	1	00:00:12.22	00:12.22	+A	Pos 7
9	TRU	Jarno Trulli	1	00:00:12.33	00:12.33	+A	Pos 8
8	WEB	Mark Weber	1	00:00:12.58	00:12.58	+A	Pos 9
3	MSC	Michael Schumac	1	00:00:19.73	00:19.73	+A	Pos 10
1	ALO	Fernando Alonso	2	00:00:21.41	00:10.35	*A	Pos 1
4	BAR	Ruben Barrichel	2	00:00:22.05	00:10.44	+A	Pos 2
2	FIS	J. Carlo Fisich	2	00:00:22.11	00:10.41	+A	Pos 3
8	WEB	Mark Weber	2	00:00:23.40	00:10.82	+A	Pos 4
0	VIL	Jacques Villene	2	00:00:24.17	00:11.94	+A	Pos 5
6	MON	J. Pablo Montoy	2	00:00:25.30	00:13.91	-A	Pos 6
7	BUT	Jason Button	2	00:00:30.78	00:20.23	-A?	Pos 7
9	TRU	Jarno Trulli	2	00:00:30.95	00:18.61	-A	Pos 8
2	FIS	J. Carlo Fisich	3	00:00:33.17	00:11.05	-A	Pos 1
1	ALO	Fernando Alonso	3	00:00:33.61	00:12.20	-A	Pos 2
4	BAR	Ruben Barrichel	3	00:00:34.79	00:12.74	-A	Pos 3
0	VIL	Jacques Villene	3	00:00:34.94	00:10.77	+A	Pos 4
6	MON	J. Pablo Montoy	3	00:00:35.32	00:10.01	*A	Pos 5
8	WEB	Mark Weber	3	00:00:35.63	00:12.23	-A	Pos 6
5	RAI	Kimmi Raikonen	2	00:00:36.13	00:24.15	-A?	Pos 9
3	MSC	Michael Schumac	2	00:00:39.56	00:19.83	-A	Pos 10
7	BUT	Jason Button	3	00:00:41.19	00:10.40	+A	Pos 7
9	TRU	Jarno Trulli	3	00:00:42.23	00:11.28	+A	Pos 8
1	ALO	Fernando Alonso	4	00:00:43.89	00:10.28	+A	Pos 1
2	FIS	J. Carlo Fisich	4	00:00:44.68	00:11.50	-A	Pos 2
6	MON	J. Pablo Montoy	4	00:00:45.66	00:10.34	-A	Pos 3
5	RAI	Kimmi Raikonen	3	00:00:46.79	00:10.66	+A	Pos 9

```

4 BAR Ruben Barrichel      4 00:00:46.95 00:12.15 -A Pos 4
0 VIL Jacques Villene     4 00:00:47.02 00:12.07 -A Pos 5
3 MSC Michael Schumac     3 00:00:50.82 00:11.26 +A Pos 10
8 WEB Mark Weber          4 00:00:54.80 00:19.16 -A Pos 6
7 BUT Jason Button        4 00:00:55.05 00:13.86 -A Pos 7
3 MSC Michael Schumac     4 00:01:01.05 00:10.22 +A Pos 1
9 TRU Jarno Trulli        4 00:01:03.11 00:20.88 -A? Pos 2
5 RAI Kimmi Raikonen      4 00:01:04.58 00:17.79 -A Pos 3
1 ALO Fernando Alonso     5 00:01:05.06 00:21.16 -A? Pos 1
8 WEB Mark Weber          5 00:01:05.61 00:10.81 +A Pos 2
6 MON J. Pablo Montoy     5 00:01:05.99 00:20.33 -A? Pos 3
4 BAR Ruben Barrichel     5 00:01:06.60 00:19.65 -A Pos 4
2 FIS J. Carlo Fisich     5 00:01:06.85 00:22.17 -A? Pos 5
0 VIL Jacques Villene     5 00:01:07.97 00:20.95 -A? Pos 6
7 BUT Jason Button        5 00:01:15.30 00:20.25 -A? Pos 7
-1
1 (1) ALO Fernando Alonso  5 00:01:05.06 4 (00:10.28)
2 (8) WEB Mark Weber       5 00:01:05.61 5 (00:10.81)
3 (6) MON J. Pablo Montoy  5 00:01:05.99 3 (00:10.01)
4 (4) BAR Ruben Barrichel  5 00:01:06.60 2 (00:10.44)
5 (2) FIS J. Carlo Fisich  5 00:01:06.85 2 (00:10.41)
6 (0) VIL Jacques Villene  5 00:01:07.97 3 (00:10.77)
7 (7) BUT Jason Button     5 00:01:15.30 3 (00:10.40)
8 (3) MSC Michael Schumac  4 00:01:01.05 4 (00:10.22)
9 (9) TRU Jarno Trulli     4 00:01:03.11 3 (00:11.28)
10 (5) RAI Kimmi Raikonen  4 00:01:04.58 3 (00:10.66)

```

BEST LAP TIME: 00:10.01 (MON J. Pablo Montoy)

## User Interface

The user interface of *gzround* is based on the library *ncurses*. When the program starts, the interface expects the user to press key **I** to start a countdown five minutes practice mode. After the countdown (or by pressing key **N**) the program starts the race with a five seconds signal (sound included).

## Keyboard Interface

If any driver has not got a transponder her laps can be introduced by hand. When you press a key with the car number (0, 1, 2, 3, 4, 5, 6, 7, 8, 9), the program understand that car has crossed the finish line and will increment its lap number and update driver's time.

## 3.3 gzclas

Program *gzclas* reads several files generated by *gzround* and generates a sorted distribution of drivers for the next round. Let us see the usage message of *gzclas*:

```

angel@herranz:~$ gzclas
gzclas 1.0.0
Processes GiroZ Round Manager leg results

```

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Usage: *gzclas* <leg results>

```

        (to report best results)
or: gzclas [-a] <leg results>
        (to report all best results)
or: gzclas [-<h> -<n> [-<d>]] <leg results>
        (to distribute best drivers)
        <h> - number of heats to distribute drivers
                1 - final
                2 - semifinal
                4 - 1/4 final
                ...
        <n> - number of drivers to distribute in every heat
        <d> - number of drivers directly classified to the final (def: 0)
or: gzclas                                (to see this help)

```

Let us have a look at several use examples:

- The results of all drivers in all heats and all legs:

```

angel@herranz:~$ gzclas -a heat*-leg*.rac
=====
Drivers classified to the HEAT 1:
1  (3) Pablo Lorenzo           24  05:01.27    2 (00:11.32)
2  (3) Pablo Lorenzo           24  05:02.45    9 (00:10.96)
3  (8) Oscar Cremades          24  05:04.53   10 (00:11.46)
4  (3) Pablo Lorenzo           23  05:02.45   13 (00:11.51)
5  (8) Oscar Cremades          23  05:03.11   23 (00:11.58)
6  (8) Oscar Cremades          23  05:03.38   20 (00:11.92)
7  (2) Alberto Lopez           23  05:06.78   13 (00:11.98)
8  (4) Alvaro Cremades         23  05:07.47    3 (00:12.35)
9  (1) Angel Herranz           23  05:09.76    7 (00:11.64)
10 (2) Alberto Lopez           23  05:12.71    9 (00:11.93)
11 (6) Angel Herranz           23  05:12.85    1 (00:09.94)
12 (4) Alvaro Cremades         22  05:01.74   10 (00:12.59)
13 (1) Javier Montero          22  05:09.80   12 (00:13.00)
14 (9) Angel Herranz           22  05:13.02    5 (00:12.26)
15 (2) Alberto Lopez           22  05:14.62   10 (00:12.28)
16 (1) Javier Montero          21  05:05.02    8 (00:12.22)
17 (1) Javier Montero          21  05:06.57    3 (00:12.49)
18 (2) Antonio Cabezuelo       21  05:14.45    6 (00:13.32)
19 (2) Antonio Cabezuelo       20  05:03.02    2 (00:12.72)
20 (4) Alvaro Cremades         20  05:05.23    7 (00:12.89)
21 (2) Antonio Cabezuelo       19  05:08.54   13 (00:14.06)
22 (5) Miguel Laloma           15  05:04.34    6 (00:17.52)
23 (5) Miguel Laloma           14  05:17.56   10 (00:17.11)
24 (5) Miguel Laloma           12  05:20.86    1 (00:14.08)
25 (3) Angel Laloma            0  00:00.00    0 (99:59.99)
26 (3) Angel Laloma            0  00:00.00    5 (99:59.59)
27 (3) Angel Laloma            0  00:00.00    0 (99:59.99)

```

- Results of the best results of each driver:

```

angel@herranz:~$ gzclas heat*-leg*.rac
=====
Drivers classified to the HEAT 1:
1  (3) Pablo Lorenzo           24  05:01.27    2 (00:11.32)
2  (8) Oscar Cremades          24  05:04.53   10 (00:11.46)
3  (2) Alberto Lopez           23  05:06.78   13 (00:11.98)
4  (4) Alvaro Cremades         23  05:07.47    3 (00:12.35)
5  (1) Angel Herranz           23  05:09.76    7 (00:11.64)

```



6	(1)	Javier Montero	22	05:09.80	12 (00:13.00)
7	(2)	Antonio Cabezuelo	21	05:14.45	6 (00:13.32)
8	(5)	Miguel Laloma	15	05:04.34	6 (00:17.52)
9	(3)	Angel Laloma	0	00:00.00	0 (99:59.99)

- Distribution for 1/4 mains with two drivers per heat:

```
angel@herranz:~$ gzclas -4 -2 serie?-?.rac
=====
Drivers classified to the HEAT 1:
1  (3) Pablo Lorenzo          24  05:01.27    2 (00:11.32)
2  (1) Angel Herranz          23  05:09.76    7 (00:11.64)
=====
Drivers classified to the HEAT 2:
1  (8) Oscar Cremades         24  05:04.53   10 (00:11.46)
2  (1) Javier Montero         22  05:09.80   12 (00:13.00)
=====
Drivers classified to the HEAT 3:
1  (2) Alberto Lopez          23  05:06.78   13 (00:11.98)
2  (2) Antonio Cabezuelo      21  05:14.45    6 (00:13.32)
=====
Drivers classified to the HEAT 4:
1  (4) Alvaro Cremades        23  05:07.47    3 (00:12.35)
2  (5) Miguel Laloma          15  05:04.34    6 (00:17.52)
=====
Not classified drivers:
9  (3) Angel Laloma           0   00:00.00    0 (99:59.99)
```

- Distribution of semifinals with three drivers per heat and one driver directly classified to the final:

```
angel@herranz:~$ gzclas -2 -3 -1 serie?-?.rac
=====
Drivers classified directly to the FINAL:
1  (3) Pablo Lorenzo          24  05:01.27    2 (00:11.32)
=====
Drivers classified to the HEAT 1:
1  (8) Oscar Cremades         24  05:04.53   10 (00:11.46)
2  (4) Alvaro Cremades        23  05:07.47    3 (00:12.35)
3  (1) Javier Montero         22  05:09.80   12 (00:13.00)
=====
Drivers classified to the HEAT 2:
1  (2) Alberto Lopez          23  05:06.78   13 (00:11.98)
2  (1) Angel Herranz          23  05:09.76    7 (00:11.64)
3  (2) Antonio Cabezuelo      21  05:14.45    6 (00:13.32)
=====
Not classified drivers:
8  (5) Miguel Laloma          15  05:04.34    6 (00:17.52)
9  (3) Angel Laloma           0   00:00.00    0 (99:59.99)
```

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