

RC-TIMING

2022

USER GUIDE v8.1.0

- one less thing to worry about -

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Getting Started

Licence

If provided, the *RC-Timing CD* must be present in the CD drive to run race meetings. **This CD may not be copied or distributed in any way whatsoever.** The CD does not need to be present for setting up meetings, managing archives/championships etc. It only needs to be there to run the actual meeting (i.e. time the races).

Alternatively, RC-Timing may be linked to a specific computer. In this situation, no CD is required, but RC-Timing can only be used to run race meetings on the one computer. If the computer is changed, a new serial number must be obtained (please contact us on info@rc-timing.com).

Installation

RC-Timing does not run directly from the CD, so you will need to install it to your hard drive before it can be used:

1. Insert the RC-Timing CD.
2. Locate your CD drive in **My Computer** and double-click the **RC-Timing_v7.4.0** installer.
3. Windows may warn that the software is from an unknown vendor. This is to be expected as we are a small supplier and are not registered with Microsoft. Use the Install Anyway option.
4. The setup program will now guide you through the installation.

Before Running RC-Timing

To ensure your PC runs as reliably as possible, it is advisable to take the following actions before running a meeting using RC-Timing:

1. Disable the screen saver. Some screen savers can use lots of processor (CPU) power, causing RC-Timing to run slowly.
2. Disable all power-saving features. Because RC-Timing runs races completely automatically, you may be away from the keyboard for a long period of time. This can cause the computer to power itself off if power-saving is enabled!
3. Disable all anti-virus software during race meetings. Anti-virus software is a good investment for anyone connecting their computer to the Internet or sharing files with other computers, but it can slow the computer down and cause problems for RC-Timing if enabled during races.
4. Back up your 'Race Data' directory and other important files regularly; hard disk drives are not 100% reliable and do fail occasionally.

Running RC-Timing

To run RC-Timing:

1. From the Microsoft Windows desktop, double-click the **RC-Timing** icon.

The first time you run the application, a window will appear asking you to enter the CD serial number:

2. Enter the *Serial Number* (printed on your CD box). This serial number will only work with the original CD, not with any copies.
3. Select the *CD Drive* that contains the CD. If using a HDD Serial Number, select the C: drive.
4. Click **OK**.
5. You will now be prompted to enter your *Region*. This determines what radio frequencies are made available, and also changes certain terminology (for example, in UK mode the word *Final* is used, whereas in USA mode, the word *Main* is used instead).

If the CD is not in the drive when you run RC-Timing, the 'Enter Serial Number' window will appear. You do not need to enter the serial number again, just insert the CD and click **OK**.

If you do not have the CD, then just click **Trial Mode**. You can run up to 10 meetings in Trial Mode. A trial meeting is only used when actually running races. Creating meetings, booking drivers in and so on will not use up a trial meeting.

Using RC-Timing

- The application consists of several screens, each performing a different task:
 - **Meeting Screen.** Allows meetings to be created, saved and loaded.
 - **Drivers Screen.** Allows drivers to be booked in and sorted into races. It then allows the races to be modified, and a race list to be printed. It also allows drivers results to be edited.
 - **Race Screen.** For running the races.
 - **Results Screen.** Allows results to be printed and saved as HTML.
 - **Archive Screen.** For creating, loading and saving archives. Also allows archive members to be displayed and edited.
 - **Championship Screen.** For creating, loading and saving championships. Also allows points to be updated, displayed and printed.
 - **PB Screen.** This keeps track of Personal Best times for drivers across multiple race meetings.
 - **Practice Screen.** For counting laps during practice sessions.
 - **Settings Screen.** Alters how the application functions.

Each screen is selected by clicking the relevant button along the left of the screen.

- Most of the buttons in the application have a letter underlined. The ‘shortcut’ for each button is to hold down the **Ctrl** key and press the underlined letter. For example, to create a new Meeting on the Meeting screen, either click (using the mouse) the **New** button, or press **Ctrl+N**. The exception is the large buttons for switching screens. The shortcuts for these are **Alt** plus the underlined letter.
- For a brief description of what a button does, position the mouse over that button. A ‘tool tip’ will appear, explaining what that button does.
- When entering data, the **Tab** key moves between different fields. For example, to move from the *Date* to the *Description* in the Meeting Screen, just press **Tab**. To move back to the *Date*, press **Shift+Tab**. Clicking each field (such as *Date*) with the mouse will also move to that field.
- RC-Timing uses four types of files for storing data:
 - **Meeting.** This file stores the meeting information, all the drivers that are booked into the meeting, what races they are in, and all their results. Every time you run a new meeting, you should create a new meeting file.
 - **Meeting Template.** This file stores basic meeting and class details; it can be used to create meetings so that it isn’t necessary to enter the same details every time a meeting is run. For example, you could create an ‘Indoor Template’ and an ‘Outdoor Template’, with different race times and qualifying/final setups for each. Each time you run an indoor meeting, you can use the Indoor Template to set the meeting up.
 - **Archive.** All driver details such as Name, Crystals and Class are stored in an Archive, so that they don’t have to be entered each time the driver races. An Archive can be used for multiple meetings.
 - **Championship.** This file stores championship points. It stores points for each class (Stock, Modified etc), and for each formula (F1, F2 etc). So you do not need a separate championship for each class or formula. A Championship can be used for multiple meetings.
- From any screen, clicking the **Save All (Ctrl+S)** button will save all Meeting, Archive and Championship data.

Race Meetings

Creating a New Meeting

Before drivers can be booked in, and before any races can be run, a race meeting first needs to be created. To create a new meeting:

1. Go to the **Meeting Screen (Alt+M)**.
2. Click **New (Ctrl+N)**.
3. Enter the *Date*. This is just a text field and can be entered in any format you wish.
4. Press the **Tab** key to move to the *Description* and enter a brief description of the meeting. This description will appear on all printouts for the meeting (such as results and race listings).
5. If you wish to load an existing *Archive*:
 - a. Click the **Change Archive** button.
 - b. Locate the archive you wish to use.
 - c. Click **Open**.

When you load an Archive, the class names that are saved in the Archive will be displayed in the *Class Details* grid. Class names are saved in the Archive file rather than the Meeting file, so that Archives and Championships can easily be sent to different clubs. This is useful for national or regional championships where rounds are hosted by multiple clubs.

If you do not select an archive now, a new archive will automatically be created the first time you enter a class name or book a driver in.

6. If you wish to load an existing *Championship*:
 - a. Click the **Change Champ** button.
 - b. Locate the championship you wish to use.
 - c. Click **Open**.
7. Press **Tab** to move to the *Rounds* of qualifying, and enter the number of rounds of qualifying the meeting will have.

8. Press **Tab** to move to the *Qualifying Type*. This determines how drivers are sorted into finals after qualifying:

- *FTQ* qualifying means that drivers will be sorted based on their Fastest Time in Qualifying. This is the most common type of qualifying.
- *Round By Round* means that drivers are given points based on their overall finishing position in each round. These points are then totalled and used to sort the finals. This is useful if track conditions are inconsistent, since it means that every qualifying round is equally important, no matter how fast or slow the track is.
If you decide to use this method, you will also need to enter the number of *Count Rounds* that count towards each driver's points total. For example, if you enter 2 rounds to count, each driver counts only their best 2 qualifying rounds.
- *Fastest Lap* means that each driver's fastest lap (from any of their qualifying heats) is used to sort the drivers into finals.
- *Consecutive Laps* means that a certain number of laps in a row are counted, for example each driver counts their 3 best laps in a row.

9. Press **Tab** to move to the *Rounds* of finals, and enter the number of rounds of finals the meeting will have.

If the meeting has more than 1 round of finals, drivers will be given points for their finishing position in each round of finals. Each driver's best points from the number of *Count Rounds* are then used to determine the overall final results.

After the points have been totalled, two drivers may have the same number of points. Selecting a *Tie Break* method allows RC-Timing to resolve these ties:

- *None* leaves the position tied.
- *Qualifying Pos* resolves the tie by giving the position to the driver who qualified highest.
- *Best Points* resolves the tie by comparing - one round at a time - each driver's points from the rounds that counted towards their overall points. This method will not always resolve the tie.
- *Countback* resolves the tie by comparing - one round at a time - each driver's points from the rounds that did not count towards their overall points. This method will not always resolve a tie.
- *Other* allows more complex tiebreaks to be specified. If the first tiebreak does not resolve the tie, then the second tiebreak is used.

If the position remains tied, an equals sign '=' is printed next to the tied drivers on overall printouts.

10. Press **Tab** to move to the large *Class Details* grid.

11. Repeat the following for each class:

- a. Enter the *Class Name*. Class names are saved in the Archive, but can be edited either from the Meeting Screen or from the Archive Screen.
- b. Press **Tab** to move to the *Heat Len* column, and enter the length of qualifying races. This can be entered in hours, minutes, seconds or laps.
- c. **Tab** to the *Race Gap* column and enter the required gap between races, in minutes or seconds.
- d. **Tab** to the *Min Lap* column and enter the minimum lap. This should normally be 1 or 2 seconds **less** than the fastest lap you would expect someone to do in this class. It is used to prevent drivers cutting corners.
- e. **Tab** to the *Last Lap* column and enter the maximum last lap. This should normally be around 5 seconds **more** than the average lap of the **slowest** drivers in the class. It is used to prevent the computer waiting endlessly for cars that have broken down or gone flat. But if you enter too small a value, cars that are still running won't get chance to finish.
- f. **Tab to the** *Start Type* column. This determines the start signal for each heat:
 - *Stagger* is the 'standard' start type for qualifying. Drivers start at one-second intervals when their car numbers are called.
 - *Grid* starts can also be used in qualifying. Cars are arranged onto a Formula 1 style grid, and all drivers start at the same time when the buzzer sounds.
 - *Rolling* allows the cars to be running while the countdown is in progress. Each cars time will start the first time it crosses the loop after the buzzer.
- g. If you wish to run finals that are a different length to the heats (common for IC/Nitro cars), press **Ctrl+Tab** to move to the *Final Lengths* grid. Enter the length of each final, then press **Ctrl+Tab** to move back to the *Class Details* grid.
- h. **Tab** to the next class, and repeat (a) to (f) for each class to be run.

Example time formats that can be entered:

Text	Meaning
10s	10 seconds
5m	5 minutes
1h	1 hour
2m30	2 minutes and 30 seconds
1h45	1 hour and 45 minutes
20L	20 laps

You can normally omit the 'h', 'm' or 's'. For example, entering '5' for the race length automatically defaults to 5 minutes, and entering '10' for the minimum lap defaults to 10 seconds.

Congratulations, you have now created a race meeting!

Saving The Current Meeting

It is essential that you save the race meeting once it has been created, even for a one-day race meeting. Otherwise, if there is a power-cut or a computer hardware failure, **all data and results will be lost**.

To save the current meeting data (including all booked-in drivers, races and results) to a file so that it can be loaded at a later date:

1. Go to the **Meeting Screen (Alt+M)**.
2. Click **Save**.
3. If the meeting has been saved before, it will automatically be saved to the same file.

If the meeting has not already been saved, you will be asked to enter a file name to save the meeting to. Enter a meaningful name such as “Summer Series Round 6” so that you can find the file again later. Then click **Save**.

Meetings can be saved in any folder, but using the default “Race Meetings” folder will make it easier for other users to find the meeting.

You should save the meeting occasionally during booking in (using the **Save All** button).

The meeting will automatically be saved after each race, to prevent results being lost if there are computer problems. However, **results can only be auto-saved if the meeting has already been saved to a file**.

Saving The Current Meeting To A Different File

If the current meeting has already been saved, you may wish to save it to a different file (for example, to create a backup). To do this:

1. Go to the **Meeting Screen (Alt+M)**.
2. Click the small arrow to the right of the Save button.
3. Click **Save As**.
4. Enter a file name to save the meeting to.
5. Click **Save**.

Each time the meeting is saved, it will now be saved to this new file.

Loading An Existing Meeting

To load a meeting that has already been created:

1. Go to the **Meeting Screen (Alt+M)**.
2. Click **Load (Ctrl+L)**.
3. Locate the meeting you wish to use, then click **Open**.

The meeting details will be displayed. The meeting is now loaded.

Saving A Meeting As A Template

RC-Timing allows you to save a meeting as a ‘meeting template’. This saves key meeting information such as the number of rounds and race durations. Future meetings can then be created using this template, to avoid having to re-enter the same details if you regularly run similar meetings.

To save the current meeting as a template:

1. Go to the **Meeting Screen (Alt+M)**.
2. Click the arrow next to the **Template** button and click **Save As Template**.
3. Enter a name for the template, such as “Indoor Template”
4. Click **Save**.

Creating A Meeting From A Template

If you wish to create a new meeting using an existing meeting template:

1. Go to the **Meeting Screen (Alt+M)**.
2. Click the **Template** button.
3. Select the template you wish to use, such as “Indoor Template” (created previously using the “Save As Template” facility).
4. Click **Open**.

A new meeting has now been created using the details stored in the template. You should save the meeting to a meeting file as normal, so that RC-Timing has somewhere to store race details and results.

Importing Drivers from a CSV File

A list of drivers can be imported into RC-Timing from a CSV file. This is useful if you want to provide an online booking-in facility. To import drivers from a CSV file:

1. Go to the **Meeting Screen (Alt+M)**.
2. Create a new Meeting (or load an existing one).
3. If you already have an archive containing some driver details, load it now. Any new drivers in the CSV file will be added to the loaded archive.
4. Click the **Import CSV** button.
5. Select the CSV file to use and click **Open**.

Notes:

- All driver details will be loaded from the file. New archive entries will be created for members not already in the archive. Archive details (such as crystals and abilities) will be updated for existing members.
- Any fields not in the CSV file will keep their existing archive values. For example you might want RC-Timing to keep track of abilities, in which case don't include an ability field in the CSV file.

For a specification of the CSV format used, see 'Appendix A; CSV Driver Import File Format', Page 70.

Drivers

Booking A Driver In

To book a driver into the current race meeting:

1. Go to the **Drivers Screen (Alt+D)**.
2. If you wish to enter the driver to a specific race:
 - a. Click **Table View (Ctrl+T)**.
 - b. Use the **Arrow Keys** or mouse to select the race and car that you wish to enter the driver into.
 - c. Press **Tab** to move to the *Enter Name Or Number* box.

If you do not wish to enter the driver to a specific race (i.e. let the computer sort the drivers into races later), click **List View (Ctrl+L)**.

3. There are several ways to search for the driver you want to book in:
 - a. Using the driver's name. You can just enter part of the name if you wish; for example, entering "Smith" will find all drivers with that surname.
 - b. Using the driver's archive number. Just enter the number (such as '15').
 - c. Using the driver's BRCA number. Enter 'b' followed by the number, such as 'b1234'.

Enter the search details into the *Enter Name Or Number* box and press **Enter** to search for the driver.

4. If no matching members are found, you will be asked if you want to create a new member. If you do, click **Yes (Y)**. If not, click **No (N)**.

If just one matching member is found, their details will be displayed in the *Driver Details* section.

If several matching members are found, a list will be displayed. Select the correct member using the **Arrow Keys**, then press **Enter**. If none of the members in the list are the correct one, press **Escape**.

5. Edit the driver's details as required:
 - Use **Tab** and **Shift+Tab** to move between fields.
 - Items such as *Class*, *Car*, and *Formula* (those with an arrow to the right of them) can be changed by using the up and down **Arrow Keys**.
 - The *Paid* box can be changed using the **Spacebar**.
 - *Abilities* use a range of 0 to 100. The first time a driver races, take a rough guess at an ability for them. Abilities can then be updated automatically after each meeting, by adding points to a championship (See 'Adding Points To A Championship', Page 54).

- Crystals are added and deleted by typing their name in the *Add Crystal* box and pressing **Enter**. To add a 2.4GHz radio, enter “2.4” or “24”. To remove a driver’s crystals, type “no” or “none”.
- If at any stage you decide you do not wish to book this driver in, press **Escape** to close the driver’s details. Any changes made to the driver’s details will be kept.

6. Click **Book (Ctrl+B)** to enter the driver into the meeting.

If, during Stage 4, a new member was created, the member will automatically be added to the archive when the driver is booked in. If no archive is loaded, a new archive will automatically be created now.

Notes:

- The specific fields that are displayed on the **Drivers Screen** (such as *BRCA Number*, *Member Type* and *Paid*) can be selected in the **Settings Screen** – see ‘Selecting Member Fields To Use’, Page 67.
- *Member Types* and *Car Makes* can be edited in the **Archive Screen** – see ‘Editing Member Types’, Page 49 and ‘Editing Car Makes’, Page 48.

Booking A Driver Into Multiple Classes

Each archive member can only be booked into one class, so to book a driver into two classes you will need to copy their details to a second archive number:

1. Go to the **Drivers Screen (Alt+D)**.
2. Book the driver into their first class (see ‘Booking A Driver In’, Page 16).
3. In the *Enter name or number* box, enter the name or archive number of the driver you just booked in.
4. Press **Enter**.
5. Click **New (Ctrl+N)** to make a copy of the driver’s details under a new archive number.
6. Select the *Class*, *Member Type*, *Formula* and *Car Make* that the driver will have in this class.
7. Click **Book (Ctrl+B)** to book the driver into this class.

You can repeat these steps for as many classes as the driver wishes to race in.

Having a separate archive entry for each class means that the driver can also have a different ability and crystals for each class.

Removing A Driver From The Meeting

To remove (unbook) a driver from the current race meeting:

1. Go to the **Drivers Screen (Alt+D)**.
2. Select **List View (Ctrl+L)**.
3. Enter the driver's name.
4. When the correct driver's details are displayed, click **Unbook (Ctrl+U)**.


Alternatively:

1. Go to the **Drivers Screen (Alt+D)**.
2. Select **Table View (Ctrl+T)**.
3. Using the **Arrow Keys**, locate the driver within their race.
4. Click **Unbook (Ctrl+U)**.

Sorting Drivers Into Races

Sorting drivers into heats and into finals are both done in the same way:

1. Go to the **Drivers Screen (Alt+D)**.
2. Click **Sort (Ctrl+O)**.
3. In the *Cars/Race* column, enter the **maximum** number of cars you want in each race. The maximum limit is 100 cars per race.
4. Select the required sort options:
 - *Consistent Race Sizes* ensures that all races in a particular class have a similar number of drivers. For example, if the *Cars/Race* is set to 5, using this option would ensure that 13 drivers are split into races of 5,4,4, rather than 5,5,3.
 - *Sort On* determines how the drivers are sorted into races:
 - *Ability* sorts drivers based on their ability. This ensures qualifying heats contain drivers of similar ability. This is the standard way of sorting Heats.
 - *Formulas* sorts drivers first by formula, then by ability. Drivers of different formulas may still be in the same race, but all F1s will be higher up than any F2.
 - *Random* sorts drivers randomly. This can be used after each round to mix the heats up.
 - *Practice Results* sorts drivers based on their results in timed practice rounds. This can be used after timed practice to re-seed heats based on the overall practice results.
 - *Qualifying Results* sorts drivers based on their results in qualifying. This uses the qualifying type specified in the Meeting Screen (such as FTQ or Round-By-Round). This is the standard way for sorting Finals.
5. If necessary, click **Class Running Order** to change the order in which classes are run. This determines what order the classes are run in. Use the up and down **Arrow Keys** to select a class. Then hold down **Ctrl** and use the up and down **Arrow Keys** to move the class to the desired position.

Alternatively, use the mouse to select a class, then click the  and  buttons to move the class.

6. If necessary, click **Combine Classes** to combine several classes together into the same race(s). This is useful if you have one or more classes with a low turnout; you can run the classes together, with the drivers still scoring points for their usual championships. Classes can be combined when sorting heats and/or finals. To combine classes:
 - a. Click the **Combine Classes** button.
 - b. Click the first class you want to combine.
 - c. Hold down **Ctrl** and click each other class you want to combine.
 - d. Click **Group**.
 - e. The classes are now grouped together.
 - f. Click the Class Group you just created. It needs to be given:
 - A *Name* to appear on results.
 - A *Class* where race durations and minimum/maximum laptimes will come from.
 - g. You can create multiple class groups; for example, you could create a group containing the “2wd Buggy” and “4wd Buggy” classes and name it “Buggies”. You could then create another group containing the “Electric Truck” and “Gas Truck” classes and name it “Trucks”.
 - h. Click **OK** to exit the Class Group form.
7. Press **Enter** or click **OK** to sort the races.



Each driver’s archive number will be displayed in the *Race Table*. You can use the **Arrow Keys** to move between drivers.

When sorting finals, any driver who has the *Exclude* (from finals) box checked will not be sorted into a final.

Reordering Races

After the races have been sorted, you may wish to change the order in which the races are run. For example, you might want to run all of the A-Finals last. To reorder the races:

1. Go to the **Drivers Screen (Alt+D)**.
2. Click the small arrow to the right of the Sort button.
3. Click **Reorder Races**.
4. Use the up and down **Arrow Keys** (or the mouse) to select a race. The 'best' race in each class (i.e. the race with the highest ability drivers) will be labelled 'A', the second-best race 'B' and so on, to make it easier to reorder the races.
5. Hold down **Ctrl** and use the up and down **Arrow Keys** to move the race to the desired position.

Using the mouse and clicking the  and  buttons will also move the race.

6. Click **OK** or press **Enter**, and the races will now be reordered.

Note: If, rather than moving a specific race, you actually want to change the running order of the classes as a whole (for example, to run Stock before Modified), you should do this when you first sort the drivers into races. See 'Sorting Drivers Into Races', Page 19.

Moving A Driver To A Different Race

After the races have been sorted, you may wish to move a driver to a different race. To do this:

1. Go to the **Drivers Screen (Alt+D)**.
2. Select **Table View (Ctrl+T)**.
3. Use the **Arrow Keys** to locate the driver you wish to move.
4. Make a note of the driver's archive number.
5. Use the **Arrow Keys** to locate the position you wish to move the driver to.
6. Type the driver's archive number and press **Enter**.

The driver will be moved to the new position.

You do not need to remove them from their old position; the system does this automatically.

If the driver's previous crystal is not available in their new race, they will automatically be assigned a different crystal. If all the driver's crystals are taken, they will be put on no crystal (displayed as "?????").

Printing A Race List

After the races are sorted, you will probably want to print a race listing, so that drivers can see their race/car/crystals and so on. To print a race list:

1. Go to the **Drivers Screen (Alt+D)**.
2. Click **Print (Ctrl+P)**.

The race listing will then be printed using the printer selected in the **Settings Screen** (see ‘Selecting A Printer’, Page 41).

To change what appears on the race listing (such as crystals and formulas), see ‘Changing What Appears On Printouts’, page 65.

Printing An Alphabetical Driver List

For events where drivers pre-book before the day of the race meeting, you may wish to print an alphabetical list of drivers. You can then cross each driver off when they arrive, and unbook anyone who doesn’t turn up. To print an alphabetical driver list:

1. Go to the **Drivers Screen (Alt+D)**.
2. Click the small arrow to the right of the Print button.
3. Click **Print Alphabetical Driver List**.

Correcting Results

Once racing has begun, you may wish to change a driver's results, to apply penalties or add missed laps. To correct the results:

1. Go to the **Drivers Screen (Alt+D)**.
2. In either List or Table view, locate the driver whose results you wish to correct. When the driver is selected, their results will be displayed under *Drivers Results* (bottom right corner of the screen).

There are two ways of modifying the driver's results:

1. Click on the result (either laps or time) that you wish to correct.
2. Press **F2** to switch to edit mode.
3. Use the left and right **Arrow Keys** to move the cursor, and **Backspace** to delete a character. Edit the result as required.

Or:

1. Click the **Penalty** button.
2. Select the *Race* you wish to modify.
3. Use the buttons to modify the result. Or you can modify the result manually by editing the number of *Laps*, the finishing *Time* and the *Best Lap* time.
4. Click **OK**.

Lap Counting

Selecting A Lap Counter

Before you start running races it is necessary to select the type of lap counting hardware you are using. RC-Timing currently supports:

- AMB System 20.
- AMB rc.
- AMB rc3/rc4.
- Vostok
- IRace

To select which of these you are using:

1. Go to the [Settings Screen \(Alt+I\)](#) and click [Lap Counting](#).
2. Select the *AMB Type*.

Notes:

- Only select 'AMB rc3' if you wish to use the TCP/IP (network) interface. If you are using the serial or USB connection, select AMBrc as the type, even for an rc3/rc4 decoder, as the serial connection works in compatibility mode and appears to RC-Timing as an AMBrc decoder.
- If you do not have an AMB and intend to manually count laps, you should select 'None', because RC-Timing will not allow a race to start unless the specified AMB is connected.
- When using an AMBrc, it is necessary to 'learn' any handout transponders before racing begins, so that when a handout transponder crosses the line, RC-Timing does not classify it as an unregistered transponder. See 'Learning Transponders', Page 29 for more details.

Selecting A Serial Port

Many computers have several serial ports that you can connect the AMB system to. To select which port the AMB is connected to:

1. Go to the **Settings Screen (Alt+I)** and click **Lap Counting**.
2. Select the *Port* you wish to use.

Notes:

- Laptops usually only have one serial port, which is typically COM1.
- Desktops usually have two serial ports: COM1 and COM2.
- **Before running any races you should do a transponder test, which will also ensure that the correct port is selected.**

Using The USB Port

The AMBrc system can be connected to a USB port instead of a standard COM port. To use the USB port:

1. Connect the AMBrc system to the USB port.
2. Windows should detect that you have plugged the AMBrc in, and ask you to select a driver to use for it. Select 'Specify a location' or 'Have Disk' (this depends on your version of Windows), and locate the AMBrc driver, which will be in *C:\Program Files\RC-Timing\USBDriver\ambusb.inf*.
3. Allow Windows to finish installing the drivers.
4. Run RC-Timing, go to the **Settings Screen (Alt+I)** and click the **Lap Counting** tab.
5. Make sure that the *AMB Type* is 'AMBrc'.
6. Select 'USB' for the *Port*.

Notes:

- AMBrc systems purchased before 2002 may not have their USB ports enabled. If nothing happens when you connect the AMBrc to the USB port, you may need to return the AMBrc unit to AMB so that they can enable the port. Please contact AMB (www.amb-it.com) for more details.
- AMBrc systems purchased before Summer 2003 may have problems running with certain computers. If, when you connect the AMBrc to the USB port, either nothing happens, or you receive an error message, you may need to return the AMBrc unit to AMB so that they can upgrade the firmware inside the box. Please contact AMB (www.amb-it.com) for more details.

- The USB port on the AMBrc3 can only be used to provide power to the AMB. To communicate with the AMB, you will have to use either the Serial port or the TCP/IP port.
- USB can only be used on Windows XP and 32-bit versions of Win7 and Vista. 64-bit drivers are not available for the USB port. For 64-bit systems, you must use the Serial port with a USB-To-Serial converter.
- When using the USB connection, the AMB does not need a separate power supply; it is powered from the computer instead. This is especially useful if running meetings from a laptop; during a power failure the AMB will be powered from the laptop battery, the meeting can continue and no laps will be lost.

Testing Transponders

At the start of each race meeting, it is advisable to perform a transponder test. This will ensure that transponders have been charged up, and that the AMB system is connected correctly. To perform a transponder test:

1. Go to the **Settings Screen (Alt+I)** and click **Lap Counting**.
2. Click **Test Transponders**.
3. On the new screen that appears, click **Start** when you are ready to test the transponders.
4. Swipe the transponders over the loop. Information should appear about each transponder that was detected. If some transponders are missing, try passing them over the loop again. The metal transponder charging rack can shield the signal if it is not held upside down and perfectly flat.
5. Click **Stop** when you have finished testing the transponders, and click the cross to close the transponder test screen.

Learning Transponders

If you are using an AMBrc system, it is necessary for RC-Timing to learn all of your handout transponders. This ensures that when a handout transponder crosses the line, RC-Timing does not classify it as an unregistered transponder.

Before you run a meeting for the first time:

1. Go to the **Settings Screen (Alt+I)** and click **Lap Counting**.
2. Click **Learn Transponders**.
3. On the new screen that appears, select which car numbers you wish to use the handout transponders for. This will normally just be 1-10. However, if you wish to have more than 10 cars in a race, you can also learn handout transponders to use for the additional car numbers.
4. Click **Learn** when you are ready to learn the handout transponders.
5. Swipe the transponders over the loop. The number of transponders learnt will be displayed. If some transponders are missing, try passing them over the loop again. The metal transponder charging rack can shield the signal if it is not held upside down and perfectly flat.
6. Click **Stop** when all transponders have been learnt, and click the cross to close the 'learn transponders' screen.

When handout transponders are given to drivers before a race, **each driver should take a transponder with the last digit identical to their car number**. However, they do not have to take a transponder from a specific set (such as yellow or blue).

If running more than 10 cars in a race, it is important to remember which sets of handout transponders were learnt as 1 to 10, which were learnt as 11 to 20 and so on. For example, car 14 must take a transponder from the 11 to 20 set, and it must be the transponder whose last digit is a 4. Creating some extra stickers for the transponders with specific car numbers on them (such as 1 to 20) is normally the best way to do this.

Notes:

- **You should ensure that cars with personal transponders are kept away from the timing loop while learning transponders.** If a personal transponder does cross the loop, click **Clear New** and start again.
- **RC-Timing saves all handout transponder details, so they only need to be learnt once.**
- If you change AMB systems, using the **Clear** button will delete your old handout transponders, so that the new transponders can be learnt. If you wish to use both systems (i.e. several sets of transponders), just learn the new transponders as described above. RC-Timing can store up to 100 handout transponders (i.e. 10 sets).

Personal Transponders

The AMBrc system allows each driver to have their own personal transponder (PT). Eventually, this will eliminate the need for handout transponders, saving your club money and eliminating the hassle of handing out and collecting transponders.

If a driver has a personal transponder, their PT number should be entered into their details when they book into the meeting. This number is stored in the Archive, so will be available for every meeting that uses that particular Archive. See 'Booking A Driver In', Page 16 for more details.

Frequently Asked Questions:

- **What if a driver doesn't have a personal transponder?** RC-Timing allows you to use a mixture of handout and personal transponders. If a driver does not have a personal transponder, just leave their transponder number as zero, and let them collect a handout transponder before their race. If handout transponders are to be used, they should be learnt first – see 'Learning Transponders', Page 29.
- **What if I enter the driver's transponder number wrong?** RC-Timing records all laps, whether the transponder number is entered correctly or not. If a transponder number is entered incorrectly, the results for the unknown transponder will appear on a separate printout at the end of the race. These results can then be automatically copied to the correct driver. See 'Unregistered Transponders', Page 31 for more details.
- **What if a driver forgets to tell me they're using a personal transponder?** The laps are still counted, and will appear as an unknown transponder. See above for more details.
- **Does each driver have to use a personal transponder that matches their car number?** No. Personal transponder numbers have no relation to car numbers. Races are sorted with the best driver as Car 1, and the worst driver as Car 10. So a driver with transponder number 2345678 can race as any car number, not just Car 8.
- **What if a driver decides not to use their personal transponder?** Then they can just collect a handout transponder as usual. You do not need to delete their personal transponder number; you can leave it stored for the next time they decide to race with it.
- **What if two drivers collect the same number handout by mistake?** If for example transponders 1111119 and 2222229 are both collected and run in the same race, then one of them will count for car 9, and the other will count as an unknown transponder. There is no guarantee that the correct transponder counted for car 9, so after the race you should check which driver has which transponder and manually correct the results if necessary (see 'Correcting Results', Page 24).

For more details on the AMBrc and personal transponders, check out the AMB website at <http://www.amb-it.com>

Unregistered Transponders

When a transponder crosses the loop, RC-Timing examines the personal transponders for the current race, and the store of handout transponders, to decide which car is using the transponder. If the transponder number is not in either of these stores, it is considered to be an 'Unregistered Transponder'.

Laps for unregistered transponders are still counted, and are printed at the end of the race on a separate printout. If the unregistered transponder belongs to an archive member (for example, if a member who isn't booked in runs in a race), their name and archive number will be printed next to the unregistered transponder to help identify the culprit!

The most common reason for a transponder appearing as 'unregistered' is that a driver's personal transponder number was entered wrongly, or not entered at all. If this is the case, then the 'unregistered transponder', along with all of its results, can easily be assigned to a driver:

1. Go to the **Drivers Screen (Alt+D)**.
2. Locate the driver whose laps did not count (either by typing their name in the search box, or by locating them in their race).
3. Click the **Select** button (next to the driver's *Transponder*).
4. A screen will appear displaying all unregistered transponders (along with their results) for the driver's race. So if the driver is in race 5, all unregistered transponders in race 5 will be displayed.
5. Double-click the transponder that the driver is using. If there are several unregistered transponders you will need to ask the drivers, to find out who is using which transponder.

The transponder number, and all of its results, will be copied to the driver.

Loaning Transponders

This feature is useful if you have a few ‘loan’ transponders that are loaned to drivers for the entire meeting and returned at the end of the day.

When booking a driver in, they can be assigned any existing handout transponder as a loan transponder:

1. Click the **Select...** button next to the *Transponder* number on the drivers details screen. This will display the **Transponder Select** form.
2. Select the **Loan Transponder** tab at the top of the form.
3. From the **Loan Transponder** drop-down box, select the transponder to loan to the driver. Only transponders that have not already been loaned will be available.
4. Click **OK**.
5. The loan transponder number will now be shown for the driver. The number will be in brackets on all displays and printouts to indicate that it is a loan transponder.

Remapping Transponders

By default, handout transponders are assigned (mapped) to car numbers based on the last digit of the transponder number (e.g. transponder 3333338 will be allocated to car 8). It is sometimes desirable to change this; if transponder 1 has died but you have a working transponder 10 that is never needed, the transponder 10 can be mapped to car 1 instead.

To change transponder mappings:

1. Go to the **Settings Screen (Alt+I)** and click **Lap Counting**.
2. Click the **Handout / Loan Transponders** button.
3. Find the transponder number that you wish to remap (e.g. 3333330).
4. Change the car number for this transponder (e.g. to map this handout transponder to car 1, change the text in the *Car* column to “1”).

Team Endurance Racing

RC-Timing doesn't have a concept of a 'Team', but with a little work it is possible to run Team Endurance races. Races can run for up to 24 hours, with multiple transponders per team.

Team Endurance racing works as follows:

- Each Team is entered as a **Driver**. E.g. create Drivers for Ferrari, McLaren and Mercedes.
- The actual drivers themselves aren't booked in. You will have to separately keep track of which drivers are racing for each team.
- If each team has 1 or 2 transponders, these can be entered like normal in the **Driver** screen.
- To use more than 2 transponders per team:
 - Leave the transponders in the **Driver** screen blank for the teams.
 - Use the **Handout / Loan Transponder** screen to assign transponders to teams (see below)

To allow multiple transponders to count for a single car:

1. Go to the **Settings Screen (Alt+I)** and click **Lap Counting**.
2. Ensure that the *AMB Type* is set to 'AMBrc' or 'AMBrc3'
3. Check *Allow multiple handouts per car*.
 If you don't check this, only the first transponder across the line for each team will count!

To assign more than two transponders to each team:

1. Go to the **Settings Screen (Alt+I)** and click **Lap Counting**.
2. Click the **Handout / Loan Transponders** button to display the list of handout transponders.
3. Click the **Add** button to add a transponder.
4. Enter the number of the transponder (e.g. 2222221) and the car (team) number to assign it to.

Example, assigning three transponders to each of the three teams (cars 1, 2 and 3):

Handout Transponders ✕

Transponder	Car
2222221	1
2222222	1
2222223	1
2222224	2
2222225	2
2222226	2
2222227	3
2222228	3
2222229	3

Timing Laps During Open Practice

This section refers to timing laps during open, uncontrolled practice. In 2022 we added timed practice rounds, which aren't yet documented in the manual.

RC-Timing allows the lap counting equipment to be switched on during free practice. So if the track is open for practice during booking in, these laps can be timed and either displayed on an extra monitor (see 'Spectator Displays', Page 59) or printed after practice has finished.

Practice lap timing works best when using an AMBrc system with personal transponders, because transponder numbers can automatically be matched to driver names. However it can also be done using handout transponders, but only the transponder number will be displayed.

To time practice laps:

1. Ensure the AMB is connected.
2. Load an Archive to allow personal transponder numbers to be matched to driver names.
3. Go to the **Practice Screen**.
4. Ensure the *Min Lap* time and *Best Run* length are correct. The *Best Run* allows RC-Timing to calculate and display each driver's best run of consecutive laps, so it is possible to see who was fastest over a full race distance rather than just fast on one lap.
5. Click **Go (Ctrl+G)** to start timing practice laps.

Lap times will be displayed on the Practice Screen as well as on any spectator displays that are connected.

Clicking **Print (Ctrl+P)** will allow you to print the practice results. You can print:

- An overall list, showing details for every driver that ran during the practice session.
- Detailed results for a specific driver, showing all of their laptimes during the practice session.

Make sure you stop timing practice laps before trying to test transponders or run races. The AMB can only be used for one purpose at a time; you will not be able to run races or test transponders while practice lap timing is running.

Running Races

Starting The Races

Once the races have been sorted and a race list printed, it is time to run the races.

1. Ensure that the AMB is configured correctly (see ‘Lap Counting’, Page 25).
2. If you are using an AMBrc, ensure that any handout transponders have been learnt (see ‘Learning Transponders’, Page 29).
3. Go to the **Race Screen (Alt+R)**.
4. Click **Go (Ctrl+G)**.

The countdown to the first race will begin. The time remaining until the first race begins is displayed next to *Time*.

Controlling The Countdown

Although the countdown between races is automatic, it can be stopped and started as necessary:

- The countdown to the next race can be stopped at any time by clicking **Stop (Ctrl+T)**.
- The countdown can then be resumed by clicking **Go (Ctrl+G)**.
- If the countdown is already running, clicking **Go (Ctrl+G)** again will display the details of the next race, so that you do not have to wait until the ‘30 seconds’ point for it to appear.
- Clicking **30s (Ctrl+3)** will take the countdown to 30 seconds.
- Clicking **10s (Ctrl+1)** will take the countdown to 10 seconds.

Abandoning The Race

In poor weather, or if there is a lap counting problem, you may need to abandon the current race:

1. Go to the **Race Screen (Alt+R)**.
2. Click **Stop (Ctrl+T)**.
3. Click **Yes (Y)** to confirm that you want to stop the race.

The race will be stopped, and the results up to the point where the race was abandoned will be saved and printed.

The countdown to the next race will then begin as normal.

Selecting A Different Race

Occasionally, you may wish to re-run or skip a race. The next race can be selected by:

1. Go to the **Race Screen (Alt+R)**.
2. Click **Race/Round (Alt+R)**.
3. Enter the *Race* number and *Round* number that you wish to run.
4. Click **OK (Enter)**.

The countdown to the race you selected will begin.

After the race is over, RC-Timing will advance to the next race as normal. So if you changed to Race 2, the application will advance to Race 3. If you wish to return to a different race, you must change the race/round again.

Displaying Other Information

On the **Race Screen**, driver names, positions and lap times are always displayed. A graph showing the strength of each drivers transponder is also displayed while the race is in progress. A red graph could indicate a low battery, poor transponder positioning within the car, or a problem with the timing loop.

Other information can also be displayed:

- **Marshalls.** Click **Marsh (Ctrl+A)** to display the drivers that should be marshalling the current race. These are the drivers that were in the previous race.
- **Predicted Results.** Click **Pred (Ctrl+P)** to display predicted results for each driver in the current race:
 - *Predicted* is the result that the driver is likely to achieve, based on their average lap so far.
 - *Imp* displays a 'YES' if the predicted time is better than the driver's previous best time.
 - *Pos* is the position that the predicted result will put the driver on the FTQ list.
- **Gaps Between Cars.** Click **Gaps** to display a list of gaps between cars. *To Leader* displays the gap between each car and the leader. *To Next* displays the gap between each car and the car ahead of it.
- **More Drivers.** If there are more drivers in the race than can be displayed on the screen, pressing the **Up Arrow** key will display the drivers at the top of the race, and pressing the **Down Arrow** key will display the drivers at the bottom of the race. You can also resize the screen so that more drivers are displayed at once.

Frequency/Interference Finder

If a driver in the current race is complaining about interference, or if another driver wishes to turn on a transmitter during the race, you can use RC-Timing's Frequency Finder to help solve the problem:

1. Go to the **Race Screen**.
2. Click the arrow next to the **Race/Round** button and click **Frequency Finder (Ctrl+F)**.
3. On the left of the Frequency Finder screen are all of the drivers in the current race. If a driver is having interference, click them. All other drivers in the meeting who are on the same crystal will be displayed on the right of the screen; this makes it easy to see if a driver in the previous race is on the same crystal and may still have their transmitter switched on.
4. If someone wants to turn a transmitter on using a specific crystal, you can enter a crystal in the *Enter Crystal* box and click **Search**. All drivers in the meeting who are on that crystal will be displayed on the right of the screen. If one of these drivers is in the current race they will be highlighted, making it clear that it is not safe for someone to turn on using that crystal.

Audio Output

During the race and countdown, RC-Timing uses beeps and voices to let the drivers and spectators know what is happening. To change which sounds are used, see ‘Selecting Which Voices Are Produced’, Page 66. With all output turned on the following sounds are produced by RC-Timing:

- Optionally, when the countdown reaches 10, 5, 2 and 1 minutes until the next race, the race number and countdown time remaining will be announced. This is configurable on the [Settings Screen](#).
- When the countdown reaches 30 seconds until the next race, the race number and start order will be announced.
- When the countdown reaches 10 seconds until the next race, RC-Timing will beep at 1-second intervals, warning drivers and marshals that the race is about to start.
- When the countdown reaches 0 seconds, the race will begin:
 - During qualifying, car numbers will be called at 1-second intervals. Each driver should start when his or her car number is called.
 - During the finals, a short delay followed by a rapid series of beeps marks the start of the race.
- During the race, the running order is announced at 2-minute intervals for the first 10 minutes, then at 5-minute intervals. If there are more than 10 cars in the race, only the top 10 will be announced.
- Each time a driver crosses the timing loop a beep is produced:
 - With FTQ and Round-By-Round qualifying, if the driver is on to improve on their best result so far, they get a high-pitched beep. If they are not on to improve, they get a low-pitched beep.
 - With Fastest Lap qualifying, if the previous lap was the driver’s best lap so far, they get a high-pitched beep. Otherwise, they get a low-pitched beep.
- When drivers finish they will get a longer beep, followed by their car number, telling them that they have finished.

When all cars have finished the finishing order will be announced. During qualifying, the cars that improved will also be announced. If multiple rounds of finals are being run, from round 2 onwards the current overall positions for that final will also be announced.

Performing Tasks While A Race Is In Progress

While a race (or countdown to the next race) is in progress you can still perform most other tasks, such as reprinting results, booking drivers in, changing crystals and so on. You do not need to delay the race meeting to do these things. Just switch to the relevant screen, and make the change just as you would if a race was not in progress.

Some items, such as the length of the current race, and the drivers in the current race, cannot be modified while a race or countdown is in progress. If you attempt to change these things, a message will appear asking you to “Stop the race or countdown first”.

Printing & Saving Results

Selecting A Printer

When you run RC-Timing for the first time, it automatically selects the Microsoft Windows default printer to print all results. However, you can use any installed printer:

1. Go to the **Settings Screen (Alt+I)**.
2. Click **Printing**.
3. Select the *Printer* that you wish to use.

Automatic Printouts

After each race, the results of the race are automatically printed. At the end of each round of qualifying an overall listing is printed, so too is a listing showing the start order for each race.

You may wish to change how many copies of these results are automatically printed. For example, you might want 2 copies of each Overall Listing and each Final Result, so that one copy can be displayed for the drivers, and another copy can be given to a magazine.

To change how many copies of results are automatically printed:

1. Go to the **Settings Screen (Alt+I)**.
2. Click **Printing**.
3. Under *Automatic Printouts*, enter the number of copies of each result you want to be automatically printed. If you do not want the result to be printed automatically, just enter zero.

Reprinting Results

If the printer jams, or a printout ‘disappears’ from the results board, you may need to reprint the results. To reprint any results of the current meeting:

1. Go to the **Results Screen (Alt+E)**.
2. Select the type of *Results* you wish to print:
 - *Heat Result* will print the result of a specific qualifying heat, or the results of all qualifying heats. Use the *All Races* or *Specific Race* option to determine exactly which heat(s) are printed.
 - *Qualifying (Overall)* will print an overall listing for the *Round* you enter.
 - *Start Order Listing* will print the start order for each race.
 - *Final Result* will print the result of a specific final, or the results of all finals. Use the *All Races* or *Specific Race* option to determine exactly which final(s) are printed.
 - *Finals (multi-leg)* is used when there is more than one round of finals. It prints an overall points listing for a specific final, or for all finals. Use the *All Races* or *Specific Race* option to determine exactly which finals(s) are printed.
 - *Driver Results* prints a list of all the drivers at the meeting, showing most archive details and results from the meeting. This is intended for CSV output rather than printing.
3. Click **Print (Ctrl+P)**.

The results you requested will be printed on the currently selected printer (see ‘Selecting A Printer’, Page 41).

Saving Results As HTML (Internet Results)

The results of the current meeting can be saved as HTML files for publishing on the Internet:

1. Go to the **Results Screen (Alt+E)**.
2. Select the type of *Results* you wish to save (see ‘Reprinting Results’, Page 42 for more details).
3. Click **Save As Web (Ctrl+W)**.
4. Enter a file name to save the results to.
5. Click **Save**.

The results will be saved to the selected file.

Archives

Creating a New Archive

All driver details such as Name, Crystals and Class are stored in an Archive, so that they don't have to be entered each time the driver races. To create a new archive:

1. Go to the [Archive Screen \(Alt+H\)](#).
2. Click [New Archive \(Ctrl+W\)](#).

A new, empty archive has now been created.

Saving The Current Archive

After creating a new archive, or making changes to an existing archive, you will need to save your changes to a file:

1. Go to the [Archive Screen \(Alt+H\)](#).
2. Click [Save](#).
3. If the archive has been saved before, it will automatically be saved to the same file.

If the archive has not already been saved, you will be asked to enter a file name to save the archive to. Enter a meaningful name such as "Club Member Archive" so that you can find the file again later. Then click [Save](#).

Archives can be saved in any folder, but using the default "Race Meetings" folder will make it easier for other users to find the archive.

Saving The Current Archive To A Different File

If the current archive has already been saved, you may wish to save it to a different file (for example, to create a backup). To do this:

1. Go to the **Archive Screen (Alt+H)**.
2. Click the small arrow to the right of the Save button.
3. Click **Save As**.
4. Enter a file name to save the archive to.
5. Click **Save**.

Each time the archive is saved, **it will now be saved to this new file**.

Loading An Existing Archive

To load an archive that has already been created:

1. Go to the **Archive Screen (Alt+H)**.
2. Click **Load (Ctrl+L)**.
3. Locate the archive you wish to use, then click **Open**.

The archive is now loaded.

Creating A New Member

Members can be added to the archive during booking-in for a race meeting (see 'Booking A Driver In', page 16). Members can also be added without having to create a race meeting:

1. Go to the **Archive Screen (Alt+H)**.
2. Click **New (Ctrl+N)**.
3. Enter the member's details (see 'Booking A Driver In', page 16, for more details).
4. If you decide you do not wish to add the member to the archive, press **Escape** at any time.

Otherwise, click **Add (Ctrl+A)** to add the new member to the archive.

Creating A New Member With A Specific Archive Number

If your club uses ‘membership numbers’ to identify it’s members, then you may want the archive numbers in RC-Timing to be the same as these membership numbers. To tell RC-Timing to create a member with a specific archive number, rather than letting RC-Timing choose the next free number:

1. Go to the **Archive Screen (Alt+H)**.
2. In the *Enter name or number* box, type the archive number you want to use, then hit **Enter**.
3. If the archive number is not already in use, you will be asked if you want to create a member with this number. Click **Yes (Y)**.
4. Fill in the member’s details.
5. Click **Add (Ctrl+A)** to add the new member to the archive, using the number you specified.

Deleting An Existing Member

To delete a member from the archive:

1. Go to the **Archive Screen (Alt+H)**.
2. Enter the member’s name and press **Enter**. You can just enter part of the name if you wish; for example, entering “Smith” will find all members with that surname.
3. If no matching members are found, an error will be displayed.

If just one matching member is found, their details will be displayed in the *Driver Details* section.

If several matching members are found, a list will be displayed. Select the correct member using the **Arrow Keys**, then press **Enter**. If none of the members in the list are the correct one, press **Escape**.

4. Click **Delete (Ctrl+T)**.

The member has now been removed from the archive.

Note: Be careful when deleting archive members. Do not delete a member that is in a running championship. If you do, then the next time you create a new member, they may be assigned the deleted archive number (since it is now free). The new member will then appear in the championship with the deleted member’s points.

It is recommended that archive members only be deleted at the end of a championship. An archive can store over 4000 members, and uses very little disk space, so deleting members is usually unnecessary.

Editing An Archive Member

To edit the details of an existing archive member:

1. Go to the **Archive Screen (Alt+H)**.
2. Enter the member's name and press **Enter**. You can just enter part of the name if you wish; for example, entering "Smith" will find all members with that surname.

If no matching members are found, you will be asked if you want to create a new member. If you do, click **Yes (Y)**. If not, click **No (N)**.

If just one matching member is found, their details will be displayed in the *Driver Details* section.

If several matching members are found, a list will be displayed. Select the correct member using the **Arrow Keys**, then press **Enter**. If none of the members in the list are the correct one, press **Escape**.

3. Edit the member's details as required (see 'Booking A Driver In', page 16, for more details).
4. Press **Escape** when done. The details will be updated to the archive.

Note: The specific fields that are displayed for each member (such as *BRCA Number*, *Member Type* and *Paid*) can be selected in the **Settings Screen** – see 'Selecting Member Fields To Use', Page 67.

Printing A List Of Archive Members

To print a list of archive members:

1. Go to the **Archive Screen (Alt+H)**.
2. Click **Print (Ctrl+P)**.
3. Select whether you want the members to be ordered by archive number or alphabetically (by name).
4. Click **OK**.

Editing Class Names

Class names are saved in the Archive, and copied to the meeting whenever you load an archive. Class names can be edited either from the Meeting Screen, or from the Archive Screen. Whichever screen they are edited from, they will always be saved to the Archive. To add or edit a class:

1. Go to the [Archive Screen \(Alt+H\)](#).
2. Press **Tab** until the first *Class Name* is highlighted.
3. Use the up and down **Arrow Keys** to select the class name that you wish to edit.
4. If you wish to add a new class, press the down arrow key until an empty class name is found.
5. Type the name of the new class.

Editing Car Makes

Car makes (such as Associated and Losi) are stored in the Archive, so that existing makes can be changed, and new makes can be added. To add or edit a car make:

1. Go to the [Archive Screen \(Alt+H\)](#).
2. Press **Tab** until the first *Car Make* is highlighted.
3. Use the up and down **Arrow Keys** to select the car make that you wish to edit.

If you wish to add a new car make, press the down arrow key until an empty car make is found.

4. Type the name of the new car make.

The new car make that you entered can now be selected for any archive member. If the *Car Make* box is not visible on the [Archive Screen](#) or [Driver Screen](#), it needs to be enabled in the [Settings Screen](#) – see ‘Selecting Member Fields To Use’, Page 67.

Editing Member Types

Member types (such as Junior and Senior) are stored in the Archive, so that existing types can be changed, and new types can be added. To add or edit a member type:

1. Go to the **Archive Screen (Alt+H)**.
2. Press **Tab** until the first *Member Type* is highlighted.
3. Use the up and down **Arrow Keys** to select the member type that you wish to edit.

If you wish to add a new member type, press the down arrow key until an empty member type is found.

4. Type the name of the new member type.

The new member type that you entered can now be selected for any archive member. If the *Member Type* box is not visible on the **Archive Screen** or **Driver Screen**, it needs to be enabled in the **Settings Screen** – see ‘Selecting Member Fields To Use’, Page 67.

Championships

Creating a New Championship

At the start of a championship or series, a new championship needs to be created for storing points after each meeting. To create a new championship:

1. Go to the **Championship Screen (Alt+C)**.
2. Click **Details View (Ctrl+T)**.
3. Click **New (Ctrl+W)**.
4. Enter a brief *Description* of the championship. This will appear on all printouts of championship points.
5. The championship must have an *Archive* associated with it, so that when points are added, the system can match the drivers of the current meeting with the drivers already in the championship. To select an *Archive*:
 - a. Click the **Change Archive** button.
 - b. Locate the archive you wish to use.
 - c. Click **Open**.
6. Enter the total *Number Of Rounds* in the championship.
7. Enter the number of *Rounds To Count* towards the overall points. For example, if there are 5 rounds in total, you may wish to only count the best 3 rounds.
8. Select how points are added after each meeting:
 - From *Qualifying* results.
 - From *Final* results.
 - From both (*Qualifying* + *Finals*).
9. If the top qualifier (TQ) in each class or formula receives an extra point, select *Extra Point For TQ*.
10. If the A-Final winner in each class or formula receives an extra point, select *Extra Point For A-Final Win*.

11. Select *Tie Break* to decide how tied positions are resolved:

- *None* leaves the position tied, and prints an equals sign '=' next to tied drivers on points printouts.
- ***Countback uses non-counting results to resolve ties.*** For example:
 - a. A 5 round championship counts points from the best 3 rounds.
 - b. Two drivers both have a total of 590 points from their best 3 rounds.
 - c. The tie is resolved by looking at each driver's 4th best rounds. The driver with the highest number of points is the winner of the tie.
 - d. If the 4th best rounds are equal, then the 5th best results are compared, and so on.
 - e. If all non-counting results are equal, then the position remains tied.
- ***Best Results resolves ties by comparing only those results that count towards each driver's points total.*** For example:
 - a. A 5 round championship counts points from the best 3 rounds.
 - b. Two drivers both have a total of 590 points from their best 3 rounds.
 - c. The tie is resolved by looking at each driver's best round. The driver with the highest number of points is the winner of the tie.
 - d. If the best round is equal, then each driver's 2nd best results are compared, and so on.
 - e. If all counting results are equal, then the position remains tied.

12. If you wish to only include certain member types in the championship (for example, so that only club members score points) click the **Change** button next to *Points For*. Then select the member types that will score points in the championship. When using this feature, make sure all drivers have a member type or they will not receive any points.

13. Enter the maximum number of points per class, per meeting.

- a. Enter the *Overall* points for the class.
- b. If you also wish to store points for each formula (F1, F2 etc), then enter the maximum points for each formula being used. If some (or all) of the formulas are not being used, leave the points for that formula as zero.

Note: If you are counting points from both Qualifying and Finals, the number of points will be added for BOTH. So if you enter 100 points, the winning driver will get 200 points.

The championship is now created.

Saving The Current Championship

After creating a new championship, or making changes to an existing championship, you will need to save your changes to a file:

1. Go to the **Championship Screen (Alt+C)**.
2. Click **Save**.
3. If the championship has been saved before, it will automatically be saved to the same file.

If the championship has not already been saved, you will be asked to enter a file name to save the championship to. Enter a meaningful name such as “Club Summer Series” so that you can find the file again later. Then click **Save**.

Championships can be saved in any folder, but using the default “Race Meetings” folder will make it easier for other users to find the championship.

Saving The Current Championship To A Different File

If the current championship has already been saved, you may wish to save it to a different file (for example, to create a backup). To do this:

1. Go to the **Championship Screen (Alt+C)**.
2. Click the small arrow to the right of the Save button.
3. Click **Save As**.
4. Enter a file name to save the championship to.
5. Click **Save**.

Each time the championship is saved, it will now be saved to this new file.

Loading An Existing Championship

To load a championship that has already been created:

1. Go to the **Championship Screen (Alt+C)**.
2. Click **Load (Ctrl+L)**.
3. Locate the championship you wish to use, then click **Open**.

The championship details will be displayed. The championship is now loaded.

Adding Points To A Championship

After running a race meeting that is part of a championship, it is necessary to add points to the championship. To add points:

1. Go to the **Championship Screen (Alt+C)**.
2. Click **Add (Ctrl+A)**.
3. Enter the *Round Number* to add points to.
4. If you want member abilities to be updated based on the championship points, ensure *Update Member Abilities* is selected.
5. If the meeting has more than one round of finals, the points can be updated in one of two ways:
 - a. *One Championship round (using overall Final results)* will create just one round of championship points. The championship points for the finals will be calculated using the overall final positions (calculated using leg points).
 - b. *Multiple Championship rounds (one for each Final leg)* will create a round of championship points for each round of finals. So if there are 3 rounds of finals, 3 rounds of championship points will be added. If points are being added for qualifying as well, the qualifying points will be added to each round. So if there are 101 points for qualifying and 100 for finals, a driver that qualifies first and wins all 3 final legs will have 201 points for all 3 championship rounds.
6. Click **OK (Enter)**.

Points will be added to the specified round, based on the results of the current meeting. Points are automatically added to all tables for each class: Overall, F1, F2, F3 and F4.

Any driver who has the *Exclude* box checked AFTER sorting the finals will be excluded from the championship points. This is useful for removing drivers who have been disqualified, or just shouldn't count for points, e.g. excluding factory drivers, or someone testing a non-approved tyre.

Updating Member Abilities

It is often desirable to be able to sort qualifying races based on championship points. This is done by updating each member's ability based on their championship points, and then sorting heats on ability as normal. To update abilities from the championship points, make sure that *Update Member Abilities* is selected when adding points after each round. See 'Adding Points To A Championship', Page 54.

Abilities will automatically be updated after each round using the Overall points for each class, looking only at points from the number of rounds to count.

To calculate abilities, a percentage is calculated for each driver. For example, a driver who has done 3 rounds, scoring 200 points at each, will receive the same ability as someone who has done one round and scored 200 points, as they have both achieved 100%. This system ensures that similar drivers are given similar abilities, so that fast drivers are not placed in slow qualifying heats, just because they missed a round of the championship.

Viewing Championship Points

To view the current championship points:

1. Go to the **Championship Screen (Alt+C)**.
2. Select **Points View (Ctrl+O)**.
3. Select the required *Class*.
4. Select the required *Formula* (Overall, F1, F2 etc)
5. Points can be displayed by *Round Number*, which is the standard way of viewing points.

Points can also be displayed from *Best To Worst* for each driver. This is useful when trying to work out 'who will finish where' as the championship draws to a close. By displaying points *Best To Worst*, each driver's worst counting points will be in the same column. For example, if there are 3 rounds to count towards overall points, column B3 will contain each driver's worst points.

It is therefore much easier to work out 'drop scores', giving drivers a better idea of who they need to beat at the next meeting, and by how many points.

After selecting these options, the points will automatically be displayed.

Printing Championship Points

To print the current championship points:

1. Go to the **Championship Screen (Alt+C)**.
2. Select **Points View (Ctrl+O)**.
3. Select *Order By Round Number* or *Order Best To Worst*. See 'Viewing Championship Points', page 55, for more details.
4. Click **Print (Ctrl+P)**.
5. If both Overall and Formula championship tables are in use, you will be asked whether you want to print *Overall Tables*, *Formula Tables* or *All Tables*.

The points will then be printed to the currently selected printer (see 'Selecting A Printer', Page 41).

Saving Championship Points As HTML (Internet)

Championship points can be saved as an HTML file for publishing on the Internet:

1. Go to the **Championship Screen (Alt+C)**.
2. Select **Points View (Ctrl+O)**.
3. Select *Order By Round Number* or *Order Best To Worst*. See 'Viewing Championship Points', page 55, for more details.
4. Click the small arrow to the right of the Save button.
5. Click **Save As Web**.
6. Enter a file name to save the points to.
7. Click **Save**.
8. If both Overall and Formula championship tables are in use, you will be asked whether you want to save *Overall Tables*, *Formula Tables* or *All Tables*.

The points will be saved to the selected file.

Editing Championship Points

To edit championship points, for example to apply penalties:

1. Go to the **Championship Screen (Alt+C)**.
2. Select **Points View (Ctrl+O)**.
3. Select the required *Class* and *Formula*.
4. Select *Order By Round Number* (points cannot be edited when ordered from best to worst).
5. In the large points grid, use the **Arrow Keys** to select the points that you wish to modify.
6. Type in the new number of points.
7. Press **Enter**.

The points have now been edited. When you select a different driver, the drivers will be reordered to reflect the changes in points.

Manually Adding A Driver To The Championship

RC-Timing automatically adds drivers to the championship when you update the championship points from the results of a meeting. However, if you are transferring points from different software, you may need to add drivers manually to the championship. To add a driver:

1. Go to the **Championship Screen (Alt+C)**.
2. Select **Points View (Ctrl+O)**.
3. Select the *Class* and *Formula* that you wish to add the driver to.
4. Click **Insert (Ctrl+N)**.
5. Type the name or archive number of the driver you wish to add to the championship.
6. Press **Enter**.

The driver will be added to the championship, and will be at the bottom of the table with zero points.

Removing A Driver From The Championship

To remove a driver from the championship:

1. Go to the **Championship Screen (Alt+C)**.
2. Select **Points View (Ctrl+O)**.
3. Select the *Class* and *Formula* that the driver is in.
4. Click the small arrow next to the Insert button.
5. Click **Remove**, and then confirm that you wish to remove the driver from the championship. Once this is done, all of their points will be deleted.

Spectator Displays

Overview

RC-Timing allows you to connect extra displays to the race control computer that can be viewed by drivers and spectators. These displays can be computer monitors, projectors or televisions. This is all achieved using standard computer hardware, so no expensive adaptors or converters are required.

The extra displays have a different format to the main race control screen:

- The text size is much larger.
- Only relevant information is displayed.
- The displays are always in ‘race’ mode, so spectators can’t see you changing crystals or applying penalties.

How to set up these displays varies slightly depending on whether you are using a laptop or a desktop computer. The most common setups are described in the subsequent sections.

Laptops

Almost all laptop computers have a VGA monitor socket, allowing you to connect a standard PC monitor to them.

Monitor extension leads and booster boxes can be purchased, allowing multiple monitors to be used and positioned anywhere around the track or pits. We recommend using heavy-duty cables, which are usually thick and have a black, textured coating. These are stronger than standard cables and can be used over much greater distances without a booster (up to 50m or 160ft). Cheaper grey cables often give very poor picture quality even over short distances. Check out the links page on our website www.rc-timing.com for suppliers of booster boxes and extension leads.

Many laptop computers also have a Composite Video or S-Video socket, allowing you to connect a television to them. The television will require a Composite Video socket, an S-Video socket or a SCART socket and an adaptor (see 'Sockets and Adaptors', Page 63).

To use either a monitor or a television as a spectator display:

1. Connect the display to the laptop using the appropriate leads.
2. Power on the laptop and wait for Microsoft Windows to load.
3. Right-click the Windows desktop and select **Properties**.
4. Go to the **Settings** tab.
5. You should see two displays available; the main laptop screen and the additional screen you just connected.

If the additional screen is not shown it is possible that the laptop does not support independent displays, and will only mirror the main display onto the extra display. It is also possible that the proper display drivers are not installed. These are usually included on a CD supplied with the laptop, but are often available on the Internet as well, either from the laptop manufacturers website or the graphics card manufacturers website. If you have problems getting extra displays to work, try installing the latest available drivers.

6. If the extra display is 'greyed out', right-click the display and make sure the *Attached* property has a tick next to it.
7. Ensure *Extend my Windows desktop onto this monitor* is selected.
8. Click **Apply**. If everything is working correctly, your Windows backdrop will now appear on the extra display.
9. Make sure that the *Screen Area* for the display is set to 640x480 pixels.
10. Click **OK**.

You can now start RC-Timing and select the new display as a spectator display (see 'Using A Spectator Display', Page 67).

Desktops

Desktop computers usually only have one monitor output, although some high-end systems may have two. To connect an extra monitor to a desktop computer you will need to purchase and install a second graphics card. These cost as little as £10; an expensive graphics card is not necessary for a spectator display as it is only showing basic text.

If you are not experienced in assembling computers then it is best to let a shop such as PC World install the additional graphics card for you. If fitting the extra card yourself it will need to be a PCI card, as computers only have one AGP socket and this is normally used by the main graphics card.

If you wish to use a television as a spectator display then make sure the extra graphics card has a TV output socket. ATI (www.ati.com) are a popular manufacturer of graphics cards with built-in TV output.





Monitor extension leads and booster boxes can also be purchased, allowing multiple monitors to be used and positioned anywhere around the track or pits. We recommend using heavy-duty cables, which are usually thick and have a black, textured coating. These are stronger than standard cables and can be used over much greater distances without a booster (up to 50m or 160ft). Cheaper grey cables often give very poor picture quality even over short distances.

To use either a monitor or a television as a spectator display:

1. Connect the display to the computer using the appropriate leads.
2. Power on the computer and wait for Microsoft Windows to load.
3. Right-click the Windows desktop and select **Properties**.
4. Go to the **Settings** tab.
5. You should see two displays available; the main screen and the additional screen you just connected.
6. If the extra display is 'greyed out', right-click the display and make sure the *Attached* property has a tick next to it.
7. Ensure *Extend my Windows desktop onto this monitor* is selected.
8. Click **Apply**. If everything is working correctly, your Windows backdrop will now appear on the extra display.
9. Make sure that the *Screen Area* for the display is set to at least 640x480 pixels.
10. Click **OK**.

You can now start RC-Timing and select the new display as a spectator display (see 'Using A Spectator Display', Page 67).

Sockets and Adaptors

<p>VGA Socket</p> <p><i>Found on older laptops</i></p>	
<p>HDMI Socket</p> <p><i>Found on newer laptops</i></p>	
<p>HDMI to VGA cable</p> <p><i>For connecting older monitors to newer laptops</i></p>	
<p>VGA Monitor Splitter & Booster</p> <p><i>For connecting multiple monitors over longer distances</i></p>	

Settings

Selecting A Country

RC-Timing supports crystals for several different countries. To select your country and change which crystals are in use:

1. Go to the **Settings Screen (Alt+I)** and click **General**.
2. Select the *Region* you are in. If your region is not listed, please contact us and we will be glad to add crystals for your country.

Changing What Appears On Printouts

To change what fields appear on printouts (such as crystals, formulas and car makes):

1. Go to the **Settings Screen (Alt+I)** and click **Printing**.
2. Under *Print Fields*, ensure there is a tick next to the fields you want to appear on printouts. Not all fields will appear on all printouts. For example, crystals will only appear on Heat/Final listings.

Configuring Race Graphs For Printouts

On each heat and final result, a graph can be printed to show how the race changed over time. To configure what graphs are printed:

1. Go to the **Settings Screen (Alt+I)** and click **Printing**.
2. Under *Race Graphs*, select the type of graph you want to be printed on each *Qualifying* and *Final* race result:
 - *None* means that no graph will be printed. This will make printing much faster on slow printers.
 - *By position* means that the graph will show how the positions of the cars changed lap after lap.
 - *By fastest on each lap* means that the graph will show, for each lap of the race, who was fastest on that lap. This can be useful during FTQ qualifying, where times are usually more important than positions.

Note: A colour printer is highly recommended for race graphs. Each car will then appear as a different coloured line on the graph, making it far easier for drivers to see which line is their car.

Changing The Staggered Start Gap

When using staggered starts in qualifying, cars normally start at one-second intervals. If you wish to change the length of this interval:

1. Go to the [Settings Screen \(Alt+I\)](#).
2. Click [Audio](#).
3. Under *Staggered Start Gap* enter the gap you wish to use, in seconds. For example, to use a 1.5 second gap, enter “1.5”.

Selecting Which Voices Are Produced

RC-Timing uses voices and beeps to keep drivers and spectators informed before, during and after each race. However, if you have a human commentator, you may wish to turn certain voices off. To select which voices are used:

1. Go to the [Settings Screen \(Alt+I\)](#).
2. Click [Audio](#).
3. Under *Voices*, select which voices you would like to be used:
 - *All Voices* uses the full range of voices.
 - *Start/Finish Voices Only* turns off the running order given during the races. This is normally used to prevent RC-Timing talking over a human commentator during finals.
 - *No Voices* turns off all the voices, so only the beeps are used.
4. Under *Warn About Next Race* select when you would like RC-Timing to warn the drivers about the time until the next race. These announcements will only be made if there is a large enough gap between races; they will not interrupt the previous race.

Selecting Member Fields To Use

So that the **Drivers Screen** and **Archive Screen** are not cluttered up with fields that you don't use, the fields that are displayed (such as *BRCA Number* and *Member Type*) can be changed:

1. Go to the **Settings Screen (Alt+I)**.
2. Click **General**.
3. Under *Member Fields To Use*, the fields that you wish to use should have a tick next to them. To change which fields are ticked, click each field using the mouse.

Alternately, press **Tab** to move between fields, and press the **Space Bar** to add or remove the tick.

When you return to the **Drivers Screen** or **Archive Screen**, the fields you selected will now be displayed for each member, so that they can be edited.

If you want some of the fields to appear on printouts as well as the screen, see 'Changing What Appears On Printouts', page 65.

Using A Spectator Display

To use a spectator display with RC-Timing:

1. Connect the display and ensure it is configured correctly in Microsoft Windows. See 'Spectator Displays', Page 59 for more details.
2. Go to the **Settings Screen (Alt+I)** and select the **Displays** page.
3. Under *Spectator Displays* select the graphics card that the spectator display is attached to. On laptop computers you may see two cards with the same name; the one at the top is usually your main display, and the one at the bottom your spectator display.
4. Click *Test Displays*.

If everything is working correctly, RC-Timing will draw a test screen on the spectator display.

The spectator display will now automatically be used whenever it is connected. It will be used to display practice lap timing, current race progress (if a race is running) and previous race results (when a race has finished).

Using A Heat Board

If you have a large display board for displaying the current race number, you can use this board with RC-Timing.

To change the heat board settings:

1. Go to the [Settings Screen \(Alt+I\)](#).
2. Click [General](#).
3. Under the *Heat Board* section, select the *Type* of heat board that you have.
4. For serial port driven heat boards, select the *Port* that the heat board is attached to. This can be the same port as an AMB System 20 (you will need a suitable splitter), or a separate port.

Note: A heat board cannot use the same port as an AMBrc system. If you only have one serial port, consider connecting the AMBrc to a USB port instead.

Using Start Lights

If you have start lights to signal the start and finish of each race, you can use these lights with RC-Timing. Currently, only lights that connect to a standard serial/com port are supported.

To change the start light settings:

1. Go to the [Settings Screen \(Alt+I\)](#).
2. Click [General](#).
3. Under the *Start Lights* section, select the *Type* of start lights that you have.
4. Select the *Port* that the start lights are attached to.

Note: Start lights cannot use the same port as an AMB system.

Appendices

Appendix A; CSV Driver Import File Format

The file will have the following header row:

```
"Name", "BRCA Number", "Club Number", "Class Number",  
"Formula Number", "Member Type Number", "Grade", "Crystals", "PT No", "PT No 2",  
"Junior", "Paid Status", "Car Make", "Entry Desc"
```

Notes:

- Full specifications of each field are below.
- Each field in both the header row and data rows must be enclosed by inverted commas, such as "Fred Blogs".
- Not all fields are used by RC-Timing; the file format is a generic one that can be used by any make of timing software.
- Not all fields need to be present; RC-Timing will pick up whatever fields are present and leave the remaining fields set to their existing archive values (or set them to defaults when creating a new member). The header row should only contain the fields that are present, so that RC-Timing knows what data is in each entry.
- Fields can occur in any order; the header specifies the order of the fields.

Name

String - containing any printable character except "

(ie Fred Blogs, Joe-Bloggins, Frank McDough, Ted D'silver)

BRCA Number

Int - from 1 to 32767

(0 if not known)

Club Number

Int - from 1 to 32767

(0 if not known)

This is the Archive Number of the member. If this is not present, RC-Timing will search the Archive for a member with a matching BRCA and Class Number instead. If the BRCA Number or Class Number is not present (or no matching member is found), a new Archive Member will be created using the next free archive number.

Class Number

Int - from 1 to 32767

(0 if not known)

Each Class Name (set on the Meeting or Archive Screen) corresponds to a Class Number; 1 for the first class and so on.

Class

String

The name of the class the driver will be entered to. If a class already exists with this name, the driver will be entered to that class. Otherwise, a new class will be created with this class name. Therefore it's vital that the class names exactly match those in your existing archive.

Formula Number

Int – from 1 to 4
(0 if not known)

Member Type Number

Int – from 1 to 32767
(0 if not known).

Each Member Type (set on the Archive Screen) corresponds to a Member Type Number; 1 for the first type and so on.

Grade**Ability**

Int - from 0 to 100
(where 100 = high grade, 1 = low grade, 0 = unknown grade)

Crystals

A list of crystals, separated by commas. Each crystal is shown as a decimal, specifying the full frequency (eg “40.665,27.095,2.4”)

PT No**PT No 2**

Int – specifying the personal transponder number
(0 if no PT)

Junior

Int - specifying the max age for the class
(eg under 13s = 13, under 16s = 16, if not juniors this value will be 0).

RC-Timing will use the ‘Member Type’ field to store this data, naming the field “Under 13”, “Under 16” and so on. It is probably simpler to use the *Member Type Number* instead.

Paid Status

Boolean - 1 or 0
(ie paid = 1, un-paid = 0)

Car Make

String - containing any printable character except "

The make of car for the driver (e.g. Schumacher or Xray). The make must be in the list of makes set up in the Archive Screen, or it will be ignored.

Entry Desc

String - one of the following: entry, update

If *entry* is specified, then the driver’s details will be updated in the archive (a new member will be created if they are not in the archive) and they will be booked into the meeting.

If *update* is specified, only an archive update will take place; the driver will not be booked in to the meeting.

Sample File Content

```
"Name","BRCA Number","Class Number","Grade","Crystals","PT No",
"Fred Blogs","4321","1","95","2.4","3232323"
"Frank McDough","1234","1","50","665,695","2323232"
```

Appendix B; Heatboard COM Port Output

Overview

Messages are sent over the RS232 COM port. A USB to Serial converter can be used if no COM port is present on the computer.

Data is sent at 9600 baud, with no parity, 8 data bits and 1 stop bit.

Messages are sent roughly once a second.

Protocol

Messages are bracketed with square brackets []

Fields are separated by colons :

Items within list-fields are separated by commas ,

[round:race:mins:secs:car1,carN,:laps1,lapsN,:improver1,improverN,:]

All data is in ASCII.

- carN = The car number in position N (1 to 99)
- lapsN = The laps completed by the car in position N
- improverN = The car numbers of each improver in the race

Improvers list may be blank if no one has yet improved (or no one improved in the race that just finished).

Example

Round	1
Race	12
Time	3:54
Order	6,4,10
Laps	6,6,5
Improvers	10

[1:12:3:54:6,4,10,:6,6,5,:10,:]

Appendix C; Start Lights Control

Hardware interface

The start lights connect to a standard RS232 serial/COM port on your computer (or a USB port with an adapter).

They are controlled using the RTS (pin 7) and DTR lines (pin 4) of the port. The control is:

RTS	DTR	Result
On	On	Green lights on
Off	On	Red lights on
Off	Off	Lights off

The RTS/DTR lines alternate between -12v and +12v so aren't much use for driving anything directly. You'll need someone with some micro electronics skills to make up a control circuit for you, using a MAX232 chip, some logic gates and some transistors/relays to control the power.

RC-Timing actions

The lights will go Red at the '30s to next race' warning, and stay red until the 10s countdown starts. The lights will flash Red during the 10s countdown (one flash per beep).

For a heat start, the lights will flash Green for each car number called (so the drivers need to remember their starting position and count the flashes).

For a final start, the lights will go Green when the race starts (and stay Green for about 10s).

When a car finishes, the lights will flash Red as the car is called finished.

When the race is over the lights will go Red (and stay Red for about 10s).