

RACEGUN COMPUTER GRIP FOR WGP AUTOCOCKER

Users Manual & Installation Guide

Racegun CGK Manual version 1.11

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© 2001 Racegun Products Aps
Priorparken 152
2605 Broendby
Denmark
www.raceguns.dk

- PATENT PENDING -

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Installation Guide

the Racegun Computer Grip Kit. Your computer grip can be installed at home using the included materials and tools. Please read the important warnings below before starting.

Introduction

Congratulations on buying what we have tried to make the best performance upgrade for your marker ever. We hope that you will see countless hours of trouble free operation from this kit, but should you encounter any difficulties you will find a troubleshooting guide in the back of this manual and additional information on our website www.raceguns.dk. The software in your computer grip is updateable using the Racegun Interface Program and the included interface cable. The latest software is always available for free download at www.raceguns.dk. The software and cable also gives you access to a lot of extra features in your grip, such as uploading and downloading settings, downloading statistics and performance data, setting tuning parameters and much more.

A few words of caution on installing and using our computer grip kit:

Be sure to depressurise your marker completely before starting the installation. Paintball markers are pressurized up to 310 bar (4500 psi) and can cause serious injuries if handled wrong. Disconnect your air, nitro or CO₂-bottle completely and bleed the pressure from all stages of the marker by dry-firing or similar method.

Handle the circuit board with care, as some components are sensitive to static electricity or short-circuiting. Although the board is protected by lacquer, in general you should avoid touching the board except when using proper electrostatic protection.

Do not over pressurise the 5-way valve, as it is an industrial component designed to handle a maximum of 7 bar (100 psi). You should set your front pressure regulator to its minimum pressure setting and work up from there. See the installation walk through below for more.

Use only the included charger for your grip. You can damage your batteries and electronics by using the wrong charger. The grip has its own charging circuits, protecting against overcharging, short circuiting etc. but only to a certain degree.

Charge your grip for 4 hours before the first use. You will see the best consequent battery performance if you charge your grips batteries for 4 hours the first time. A note: the batteries are of a type that has no so-called “memory effect”. You do not need to discharge them completely before charging, and frequent short time charging does not damage them.

Use only Racegun software and cable to download and upload software and data to and from your grip. The computer board is easily damaged by misuse of the interface.

Always be very careful when connecting or disconnecting the battery plug to the board. Use pliers to pull the plug out – do not pull the wires.

Removing old components

The Racegun kit completely replaces some parts in your marker and these will need to be removed first.

1. Remove the complete grip with both retaining screws. The kit contains new and longer screws.
2. Remove the old 5-way valve by either cutting the three 1/8-inch hoses, leading to and from it, directly above the 5-ways fittings, or by disassembling the fittings. The latter may not be possible on some markers. Unscrew the 5-way from the front block and remove together with the trigger/actuating rod. It might be necessary to remove the LPR front regulator first. If so, leave the LPR off for now.

Installing the 5-way valve

The 5-way valve must be mounted to the front block of your marker by using the supplied bracket, nut, fittings and screws.

Warning!

The 5-way valve will be pressurised to 7 bar (100 psi). All connections and fittings need to be properly assembled to ensure secure operation.

Install the bracket using the supplied hollow nut.

It will most likely be necessary to remove the front LPR regulator temporarily. If you haven't already done so, remove the regulator.

Screw the 3 supplied air fittings into the new 5-way valve.

Valve side with 3 ports: fit 1 air fitting into the centre port.

Valve side with 2 ports: fit one air fitting into each port.

Tighten the fittings lightly so they can still swivel. Cut the supplied piece of hose into 3 and connect them to the fittings.

Attach the 5-way valve to the bracket using the supplied screws and spacers. It will only fit in one orientation. Note that the spacers go *between* the valve and the bracket. Take care not to over tighten the screws; the threads are very small and only aluminium.



Swivel the fittings as needed, cut the hose-ends to final length and press them onto the front regulator and RAM.

Valve top (one fitting in centre port): connect to LPR regulator outlet.

Valve bottom (2 fittings): front port connects to back of RAM; rear port connects to front of RAM, i.e. the hoses cross over.

Tighten down the fittings in final position.

The two unused ports in the 5-way are for exhaust air from the RAM and may be covered by two blind 90° fittings to protect them from dirt and paint.

Installing the grip

Attach the grip to the marker body using the two supplied screws. Take care not to squeeze the wires between the grip and body. First attach very loosely, and when you meet resistance, cock your hammer manually before tightening completely. Do not force it!

Important!

The sear lug screw should be set approx. 1-1.5mm (0,04-0,06") up measured from the bottom of the body as a starting point. Best working point is individual and should be experimented, but usually 1mm (0,04") works best. If something binds when you cock your marker manually, something is wrong. **Do not force it!** Disassemble and repeat and check above steps.

Warning!

When mounting the grip to the body of the marker, it is possible to squeeze the black wires exiting the solenoid housing down into the end of the solenoid pin. This can disable the solenoid. Check wires for clearance if your grip won't release after mounting.

You need to connect the loose black and red lead to the 5-way valve. There are several ways of doing this:

1. Easy disassembly: route the large plug through the hollow nut and insert the plug in the 5-way. Route the wires around the air receiver (if any), down the grip top groove and into the hole on the right side of the solenoid (seen from behind).
2. Nicest look: route the large plug through the hollow nut and insert the plug in the 5-way. Route the wires through the air receiver (if any), down the grip top groove and into the hole on the right side of the solenoid (seen from behind). Loosen the solenoid temporarily to do this. Plug the small wire connector into the female connector marked "4way" on the computer board. Be *very* careful with the small plug.

Installing the optional sensor

The ball eye sensor

- is installed by drilling the body through right below the ball feed tube. Windows are then cast into the holes and shaped to match the internal bore of the chamber. The sensors themselves are cast into the holes at the same time. The whole procedure must be done at a specially equipped shop, using specific Racegun drilling and press tools. See www.raceguns.dk for a list of shops that perform the modification.

Powering up the first time

To power up your grip for the first time you need to make sure that the air or CO₂ is disconnected, there is no paint in the breech or feed, all steps in the previous installation have been carried out. Then you are ready.

1. Plug in the battery by unscrewing the left hand side of the rubber grip and insert the plug at the free end of the wire coming from the top of the battery into the socket marked "Bat". Be very careful with the plug; it's fragile. Reassemble.
2. Charge the battery for 4 hours this first time to get the best subsequent performance from it..
3. Turn on the grip by holding down **ⓘ** for half a second. The computer will do a self-test and return the 5-way valve to its starting position. Do not press any other buttons or the trigger during this. When the grip is ready, the green LED will light.
4. Pressurise your marker slowly. If any leaks occur, depressurise and fix them before continuing. Keep clear of the back block during this.
5. Dry fire a few times to test operation. Press **ⓘ** and **▼** for half a second to set the grip live. If your sear hangs up during this, don't despair, read on in "Adjusting Operation" below. You need to set the grip "live" – see users manual.
6. Adjust what needs adjusting – read through all the sections covered in "Adjusting Operation" below.

The computer grip powers up in classic Autococker semi-auto mode by default. If you want to use one of the other available firing modes, you must set the mode from the Racegun Interface Program. Please check the Users Manual.

Adjusting operation

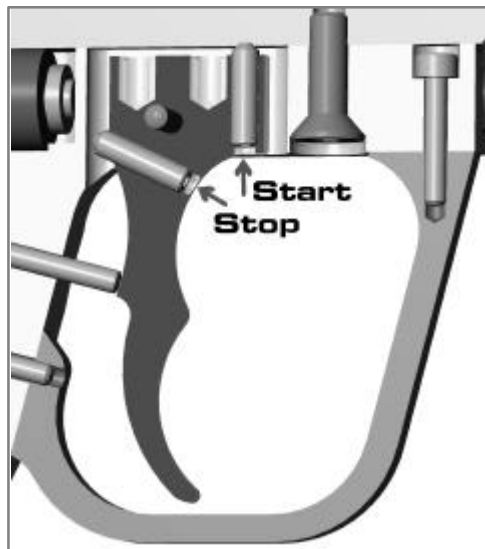
Mechanical adjustment of sear lug



- is possible by normal means. Once the grip is mounted you should turn the lug screw down lightly until it can go no further. It is now standing on the top of the sear. Go lightly on this. Turn the lug back up one full turn.

Contrary to good Autococker practice the sear and lug must have a good catch, e.g. turning it down as far as possible and then up some. With a computer grip the lug has no timing function anymore, just a mechanical locking function.

Mechanical adjustment of trigger action



- is possible using the two setscrews located in the trigger. One allows for adjusting the travel start position, i.e. the position of the trigger when not activated, and the other for the travel stop position. The trigger can be adjusted completely to taste with travels ranging from approx. 5mm (0,2 inches) down to 0,3mm (0,01 inches). The spring pressure of the trigger can be adjusted by replacing or reshaping the return and balancing springs, located above the trigger.

Note

Take care not to set the trigger stop position too far after the actual trigger point. The switch on the board allows for some over travel but will suffer damage if set too far.

Computer adjustment

- is possible using the three buttons on the grip or, to a much higher degree, the PC software and interface cable.

You can adjust the

- Loading Time, or LT (or if a sensor kit is mounted, the Maximum LT)
- Game Timer
- Shot Counters

Please refer to the Users Manual page 12.

Users Manual

This section covers normal operation and adjustments. For additional resources please see the Trouble Shooting Guide in the back of this manual or our website www.raceguns.dk

Firmware revision 114 note: several features described below are not enabled yet. These features are marked \diamond . These will become available as soon as we bring out newer versions. Please check our website under “Downloads” for these free upgrades.

Buttons, lights and plugs

Located on the back of the grip are 3 buttons, a 3-color light (LED) and a data/charging plug.

The 3 buttons marked \odot , \blacktriangle and \blacktriangledown and the LED are used for all operations on the grip described in the sections below. Many additional operations and features are accessible using the PC-interface but this is covered in the Racegun Interface Program Manual accompanying the PC-software. See www.raceguns.dk for a complete description of the Racegun Interface Program (RIP) series of software.

Turning on and off

Turn on the grip by holding down \odot for half a second. The computer will do a self-test and return the 5-way valve to it's starting position. Do not press any other buttons or the trigger during this. When the grip is ready, the green LED light, indicating the marker is ready and safe.

Safety

A green LED indicates that the marker is safe.

Press \odot and \blacktriangledown for half a second. A short beep will sound and the LED turns red, indicating the marker is live and ready to fire.

Press **ⓘ** and **▼** briefly to return to safe mode. The LED will turn green, indicating the marker is on and safe.

Batteries

The batteries are nickel metal-hydride (NiMH) and do not have the dreaded memory effect of the NiCD rechargeables. You do not need to discharge them completely before recharging and frequent short time charging does not damage them. The batteries are good for at least 15.000 shots on a charge - 40.000 shots per charge are not uncommon - under normal conditions, but capacity is affected by extreme cold or heat. Capacity will slowly decrease when the batteries are stored over long periods. A periodic recharge is recommended every 2 weeks or so.

The included charger operates at 100-240V AC and 50-60Hz, only the pins for the wall socket are country specific. If you go abroad you only need a travel kit for wall plug, not a full transformer.

Warning!

The batteries must not become hotter than +45°C (113°F) or colder than -10°C (14°F). Capacity drops off rapidly outside these temperature limits and the batteries can be damaged and ultimately explode. Do not leave your grip in direct sunlight or extreme heat.

Warning!

The grip uses standby power, even when turned off. Do not store your grip longer than two weeks without physically unplugging the batteries from the board or re-charging it for further storage. Use pliers to unplug – do not yank the wires.

◇ Battery status

If the batteries are charged sufficiently, the grip will operate as normal. As you drain the batteries there are two levels of battery alerts:

1. Low: the batteries are down to 25% capacity or less. The yellow LED will start flashing twice per second when the grip is on.
2. Critical: the batteries are down to 10% capacity or less. The red LED will flash twice per second together with a clicking sound from the beeper when the grip is on.

Charging the batteries

Insert the charger into your mains (or auto 12V DC outlet if using the auto cable) and the data/charge plug into the female plug in the back of the grip. The charging

will start, indicated by a slow red/green flashing of the LED. When the charging is complete the green LED will light continuously. When you disconnect the charger, the grip will flash as if it's charging for 10-20 seconds before it detects the absence of the charger.

Warning!

Use only the included charger for your grip. You can damage your batteries and electronics by using the wrong charger. The grip has its own charging circuits, protecting against overcharging, short circuiting etc. but only to a certain degree.

Firing modes

Depending on the country of sale, the Racegun Computer Grip supports normal classic, semi-auto, semi-auto, sniper mode, 3 shot burst mode, turbo mode and full auto. The modes are selected using the Racegun Interface Program. Please note that some countries do not allow modes other than semi or similar. It is up to you to comply with local laws.

Classic mode

One pull of the trigger will release one shot. If you pull the trigger again before the shot is fired, the trigger pull will be ignored. If you hold the trigger, the bolt will stay back.

Semi-Auto mode

One pull of the trigger will release one shot. If you pull the trigger again before the shot is fired, the trigger pull will be ignored.

◆ Sniper mode

One pull of the trigger will release one shot. The marker will not reload before the trigger is released. If you pull the trigger again before the cycle is complete, the trigger pull will be ignored.

◆ Burst mode

The computer will fire 3 shots per trigger pull. If you pull the trigger again before the 3 shots are fired, the trigger pull will be ignored.

◆ Turbo mode

When you pull the trigger more than 5 times per second, the computer will fire the marker at the maximum Rate of Fire (ROF). Otherwise as Classic mode.

Full Auto mode

As long as you pull the trigger and hold it, the computer will fire the marker at the set ROF.

◆ Specialty modes

Depending on your grip firmware and PC-software versions, additional specialty modes will be available. At this time these include only open bolt mode.

Game Timer

◆ The Racegun Computer Grip has a built in countdown timer with alarm, that can be set to any desired number of minutes. The timer can be started, stopped and reset by the buttons on the grip. Additional timer options are available from your PC using the Racegun Interface Program (RIP).

Setting timer length

Hold down ▼ while turning the grip on by pressing ① for half a second. Keep holding down ▼ until you hear 3 long beeps. The grip is now on but in timer mode, indicated by the green LED being on continuously.

You increase the timer setting with 1 minute by pressing ▲ once.

You decrease the timer setting with 1 minute by pressing ▼ once.

The marker is safe and cannot be fired during this stage. When you are finished, you press ① briefly to return to normal safe mode. The grip will make a number of short beeps, corresponding to the number of minutes set.

Example: you have set the timer to 10 minutes; the grip will emit 10 short beeps before returning to normal safe mode. When you eventually start the timer, it will count down from 10 minutes before sounding the alarm.

Starting the timer

You start the timer countdown by pressing ▲ once. When the timer has counted down the preset length of time, the grip will emit short beeps once a second until the timer is stopped or reset.

Stopping the timer

You stop the timer by pressing ▼ once. The timer is now stopped but remains where it was in the countdown. You can either resume the countdown by pressing ▲ (start) again or reset the timer as described below.

Resetting the timer

You reset the timer by pressing ① briefly once. A long beep confirms that the timer has been reset to its preset countdown time.

Counters

The Racegun Computer Grip has three built in shot counters. The first two are reset able, the third is a total shot counter and cannot be reset. Full access to the

values stored in the counters is only available through a PC using the Racegun Interface Program.

◆ Resetting counters

You reset the counters in normal safe or unsafe mode.

Press ▲ for one second to reset counter 1. A beep will confirm that the counter is reset.

Press ▼ for one second to reset counter 2. Two beeps will confirm that the counter is reset.

Timing Adjustment

◆ Adjusting Loading Time (LT)

The computer is set to a default firing rate of 10 shots per second, which is a safe setting on just about any Autococker. You can increase or decrease this to suit your Autococker, for instance if you use lightweight parts, have a fast loader etc. From the grip buttons you can set one of the 5 timings that make up a full firing cycle, the Loading Time (LT). LT is the time the bolt waits back for the ball to drop into the breech.

Hold down ▲ while turning on the grip by pressing ① for half a second. Keep holding down ▲ until you hear 2 long beeps. The grip is now on but in LT-mode, indicated by the red LED being on continuously.

You increase LT with 5 milliseconds by pressing ▲ once.

You decrease LT with 5 milliseconds by pressing ▼ once.

The marker is safe and cannot be fired during this stage. When you are finished, you press ① briefly to return to normal safe mode. The grip will make a number of short beeps, corresponding to the set LT divided by 5.

Example: you have set LT to 55mS; the grip will emit 11 short beeps before returning to normal safe mode.

Note

If you have a full sensor kit, the set LT will be the maximum Loading Time. The computer will optimise the actual LT from shot to shot.

Adjusting complete timing

The computer board goes through a sequence of timings that make up a shot. Only the Loading Time (ball drop time) can be set from the grip but from the Racegun Interface Program (RIP) you can set the complete sequence:

- ST Solenoid Time: the time the trigger/sear solenoid is pulled
- DT Dwell Time: the time the bolt waits from trigger pull until it starts to open
- CTO Cycle Time Open: the estimated time the bolt takes to move back
- LT Loading Time: the time the bolt waits for the ball to drop
- CTC Cycle Time Close: the estimated time the bolt takes to move forward

Dwell Time is the pause between the actual trigger pull and the opening of the bolt. A safe default is set but can be optimised further, especially if the full sensor kit is mounted. In non-sensor applications it is not advised to change the default. You need to keep in mind that too short a DT can work against you; if the barrel and breech haven't properly depressurised from the previous shot, air can blow up the feed and prevent the next ball from dropping right away. You should trim down the DT in small steps until you see a decrease in the actual ROF or you start chopping paint.

Dwell Time can only be set from a PC using the Racegun Interface Program

Periodic maintenance

The only maintenance required is oiling of the roller below the sear and the sear lug itself. Every 50.000 shots clean the sear and roller with a cotton pin, swivel the sear up and place 1 small drop of light gun oil (Breakfree or similar) on the roller. Place another drop on the sear where the lug catches. You should not oil any other parts of the grip. Oil in the solenoid or on the sides of the locking arm can degrade performance seriously.

If you should get serious dirt or dust into the grip you should clean the entire top pocket and all the parts in it. Take great care to note the position of the solenoid and the various spacers on it.

Racegun Interface Program

*This section covers installation and use of the PC-software for the grip kit.
For additional information please see the Help-file in the RIP software it self.*

Please note that the Racegun Interface Program (R.I.P.) is still in the beta stage. Features that are not yet implemented are clearly marked as such but are still described in full. Report bugs or problems to support@raceguns.dk

General description

Your Racegun Computer Grip can be connected to any PC using the Racegun Interface Cable and the RIP software. The plug for the interface is the same as used by the charger.

The Racegun Interface Program allows a multitude of tasks to be performed. In no particular order:

- Set all timings and other hidden tuning parameters from your screen
- Download and upload settings (weather specific, paint specific etc.)
- Monitor your marker during testing
- Download statistics from the game timers and shot counters
- Upload new firmware versions (never change a chip again!)

The Racegun Interface cable is included with your grip and comes complete with the standard RIP software. Additional pro and team modules for the RIP software can be installed as add ins. See www.raceguns.dk for a description of these modules.

Installation

Download the latest Full version from www.raceguns.dk. Unzip the zip file to a convenient directory on your hard drive and run the setup.exe file by double clicking it. The installation begins and you should complete all steps by following the instructions on your screen.

Compatibility

R.I.P. is tested with Windows 95, 98, Me, NT4 and 2000 Pro.

Errors during installation

If you encounter any errors during installation, you should select to Ignore wherever possible. Some computers have had other software installed previously that can interfere with the process, but usually ignoring this succeeds.

Previous installations

If you are installing a later version on top of an older one, you should uninstall the previous version first.

Upgrading

Software installation kits are usually available as Upgrade Only, containing only the changed files, making for a much smaller download. These upgrades should of course be installed on top of the old version.

Basic functionality

Main Window

The main window has 3 sections: Timing, Game Timer and Counters.

Timing

This section contains sliding bars for setting the 5 timing values of a firing cycle, together with the Firing Mode.

ST Solenoid Time: the time the trigger solenoid is pulled

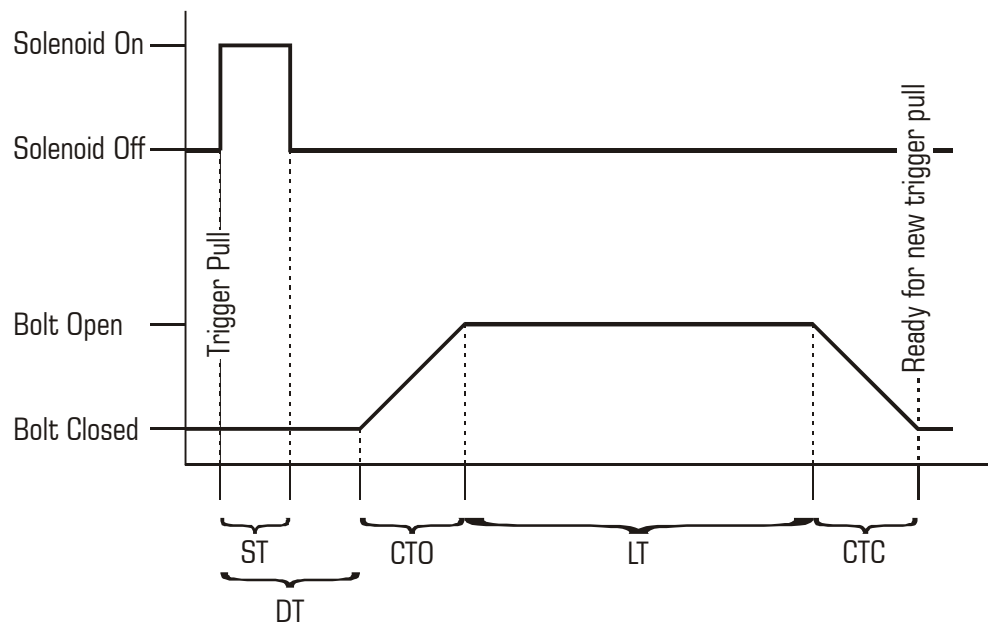
DT Dwell Time: the time the bolt waits from trigger pull until it starts to open

CTO Cycle Time Open: the estimated time the bolt takes to move back

LT Loading Time: the time the bolt waits for the ball to drop

CTC Cycle Time Close: the estimated time the bolt takes to move forward

The sequence can best be explained by this schematic:



It's important to understand that ST and DT both start at the trigger pull, and that CTO will start after ST *or* DT is finished, whichever is the highest value of those two. Thus only the highest of those two count in the complete cycle time and the calculation of BPS. Needless to say it will almost never make sense to have ST higher than DT.

It's also important to understand that CTO and CTC are only *estimated* times. As the computer grip does not have RAM-sensors, they must be entered according to the weight of the parts moving back and forth. On a standard WGP set-up with aluminium bolt and back block, both are in the 17-20mS range. If you optimise weight further you can set these in the 13-17mS range. Some set-ups with heavy stainless steel bolts might need 20-25mS to complete the motion. To give an idea of what is considered normal, heavy and light, the normal weight 2k1 WGP bolt weighs 50 grams (1.76 oz), a heavy stainless about 75 grams (2.65 oz) and a very light weight (Racegun) 32 grams (1.13 oz).

Normally only LT is enabled, but selecting Expert Mode gives access to all of the timing settings. If you have changed things beyond recovery, there is a Factory Default record in the Library that you can use to restore. See under Settings Library, Use.

◆ Game Timer

Not implemented as of now. The grip has a countdown Game Timer with alert and 2 pre-alerts. This means for instance that you can set the timer to 10 minutes, with pre-alert at 2 minutes remaining and 30 seconds remaining. See the Users Manual on how to operate the timer in the grip.

◆ Counters

Partially implemented. The grip has 3 shot counters: two user reset able and one total counter. When you press "Reset" next to a counter, the counter in the connected grip is immediately reset.

Get Settings

Click Get button. Retrieves current Timing set-up, Game Timer set-up and Counters from grip.

Get Gun Information

Access through menu Function, Get, Gun Information. Retrieves grip serial number and build versions for firmware, boot code, comms protocol and hardware. Use this information when you contact support or to verify what firmware you have before installing new versions.

Get Battery info

Access through menu Function, Get, Battery Info. Retrieves battery condition in volts. Use this to determine whether you need a recharge or not.

Get Firmware Program

Access through menu Function, Get, Firmware Program. Retrieves the current firmware program from your grip and writes it to a file on your PC. Use only to make a backup of your current firmware.

Put Settings

Click Put button. Writes current Timing set-up and Game Timer set-up from PC to grip.

Put Firmware Program

Access through menu Function, Put, Firmware Program. Lets you burn new firmware into the grip. Download the desired firmware version from our website www.raceguns.dk and save it to a convenient directory on your hard drive. Firmware files have the extension “.rgf”. Select menu Function, Put, Firmware Program and browse to the directory where you saved your download. Highlight the RGF-file and click Open. The firmware will now be burned to your grip, indicated by the status bar in the bottom of the RIP window and by the LED on the grip flashing red/green/yellow. Do nothing on your PC or grip until a window appears, confirming that the burning is complete.

Settings Library

R.I.P. contains a library for storing different timing settings together with information on how the gun was configured, weather conditions etc. Click the Library button or access through the menu Function, Library templates. A Racegun Library window pops up with your current settings highlighted.

Properties

Highlight the library record you wish to access or stay on your current, click the Properties button. A pop up appears with two pages. The first page lets you name and date the record and displays summary info on the timing. The second page contains user variables like Barrel, Paint, Temperature etc. but you can add as many as you like. To store a text in one of the variables, highlight it, click Edit and enter the value you want.

Also accessed by clicking the Properties button on the main window.

Delete

Deletes the highlighted record permanently.

Use

Takes the settings in the highlighted record and transfers them to the main window for either Putting to grip or further editing. You can also use a record in the Library window by double clicking it.

Close

Closes the Library window, saving the changes you might have made, but without transferring anything to the main window. In other words if you have browsed around in a record or two, entering or viewing information, you will not change any values in the main window by leaving the Library window with Close.

Options

The options menu item is accessed through menu Function, Options and has two pages.

Database

Here you can select what database you want to use for all your settings, library etc. Default is RIP.mdb, which is included in the normal installation.

Communication

Here you can select what COM port you use for your serial cable connection to the grip. Default is COM1. The remaining communications settings should not be changed.

A

Appendix A – Trouble Shooting Guide

This section contains solutions to the most common snags and mishaps when installing and using the Racegun computer grip kit.

<i>My gun cycles, but the hammer is not released.</i>	1. Check your battery status and plugs.
	2. Check that the timing is set with ST at 10mS or more.
	3. Check that solenoid piston, sear and locking arm move freely in the frame.
	4. Check that the black wires exiting the top of the solenoid housing are not interfering with the end of the solenoid pin.
	5. Go through “Mechanical adjustment of sear lug” in the Installation Guide.
	6. Do you have a lug screw in your hammer that has the bottom threads turned off? The contact surface with the sear must be smooth.
	7. Is the solenoid pin moving freely? It could be bent or dirt might have come between the pin and the housing. Disassemble carefully and clean. Oil as described in “Periodic Maintenance”.
	8. Have you oiled as described in “Periodic Maintenance”?
<i>My gun chops paint.</i>	1. Try going back to factory default settings for the timing. CTO and CTC should be in the 15-

	20mS range. Adjust LT to 55 and work down from that in increments of 5mS.
	2. Set the operating pressure very low on the front (LPR) regulator and work up gradually until you can cycle fast enough to keep up with the set timing.
<i>I got a lot of water into the grip frame and now nothing works.</i>	Disconnect the battery from the board. Leave the rubber grips off and let the grip dry out for a day or two in a warm spot (<i>not</i> on the heater...). Reconnect battery and try again.
<i>The uplink to my PC/Palm is not working</i>	1. Check that your connectors are free of dirt and water/condensation.
	2. Check that you cables are inserted properly at both ends.
	3. Check your serial port settings.
	4. Check that your serial port is working with another peripheral (mouse, modem, palm cradle etc.).
	5. Check that your serial port is not blocked by other software (Palm HotSync etc.).
<i>Nothing happens when I pull the trigger.</i>	1. Check the battery status and connectors. Grip should be red (live).
	2. Check that your trigger travel is sufficient to actually click the switch. Adjust the trigger stop screw if necessary.
	3. Check the computer function by inserting the PC Interface cable and download settings to your PC (Get command).

Appendix B – Menu Structure

This section contains an overview of the menu structure of the embedded firmware in the Racegun computer grip kit.

Function	Press	How	Signal
On	ⓘ	Press 0,7 s	Short beep Green LED
Off	ⓘ	Press 0,7 s	3 short beeps
Safety off	ⓘ + ▼	Press 0,5 s	Short beep Red LED
Safety on	ⓘ + ▼	Short click	3 short beeps Green LED
◇ Timer start	▲	Short click	Short beep
◇ Timer stop	▼	Short click	Short beep
◇ Timer + trip 1 reset	ⓘ	Short click	Medium beep
◇ Timer alarm			Short beep 1Hz until Timer stop or Timer reset
◇ Battery low 1		Alarm	Yellow LED blinks 1 Hz
◇ Battery low 2		Alarm	Red LED blinks 1 Hz Medium beeps 0,5 Hz
◇ Reset trip 1	▲	Press 0,7 s	Short beep
◇ Reset trip 2	▼	Press 0,7 s	2 short beeps

Appendix C – Data Sheet

This section contains most data concerning the Racegun computer grip kit.

Electronics:

- CPU: Industrial grade processor, 3.68 MHz, -40°C to +85°C
- Memory: Depending on model
- Battery: Panasonic NiMH pack, 4.8V – 700mAh or 15.000-40.000 shots depending on setup
- Charging time with supplied charger: approx. 2 hours
- Charging time with optional auto charger: approx. 2 hours
- Sear solenoid 4,8 volt nominal

Operation:

- Max. Rate of Fire (ROF): Between 9 and 16 shots per second (depending on weight of moving parts)
- Operating modes (international software version 114): classic semi auto, single shot semi auto, full auto

Pneumatics:

- Industrial grade 5-way valve certified for 1,5 barO to 7 barO (22 to 102 psi), fitting threads M5x0.8, mounting threads M3x0.5, voltage surge suppressor and red indicator lights

Appendix D – Warranty

This section contains information concerning the Racegun Products warranty policy.

The Racegun Computer Grip Kit carries a full 12 months limited warranty against defects in materials, workmanship and function. Exempt from this warranty are all parts that are subject to wear. Exempt are also damage and failures resulting from improper use, installation, or wrong adjustment. Warranty for the grip kit does not in any way cover damage to the rest of the marker.

A few examples of what is not covered:

- Damage from disassembly and reassembly for re-anodising
- Plug coming of wires because the wires were used to pull out the plug
- Damage to foil keypad due to improper transportation or handling
- Damage to trigger switch due to improper adjustment of trigger stop screw
- Damage to 5-way due to dirt or hits

Aside from these legalities, Racegun Products stands strongly behind our products and we will go to great lengths to help you with problems or mishaps. We have several on-line FAQ's at www.raceguns.dk and you can always contact us at support@raceguns.dk. We usually reply within 24 hours.