

GET THE MOST OUT OF YOUR RAMPAGE BOARD BY VIEWING OR  
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After your marker is switched on, you may notice the blue and red LED's loaded in the breach. Assuming your hopper is properly attached and filled with paint, the most likely cause is that you have not yet switched on your electronic hopper or you just need to give your hopper a "shake" so a ball feeds properly. Once a ball is properly loaded, the breach alert LED's will go out and switch to the firing mode display indicating you're ready to fire.

Although the Rampage board offers the most comprehensive set of marker controls available, your Rampage™ board requires NO programming and comes pre-configured with the most optimal default settings. Once installed, just switch it on and GO PLAY!

**QUICK STARTUP OF THE RAMPAGE™ BOARD**

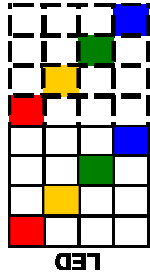
The Rampage™ board is a high-performance upgrade for your marker. We recommend using a fresh battery before any major tournament or event to ensure peak performance. To change your battery, please refer to your original owners manual.

**USING YOUR NEW RAMPAGE™ BOARD**

WARNING - ALL PERSONS WITHIN RANGE OF A PAINTBALL MARKER MUST USE PROPER EYE PROTECTION. NEVER DISASSEMBLE A MARKER WHILE IT IS UNDER PRESSURE WITH COMPRESSED AIR OR CO2. ALWAYS REMOVE THE AIR SOURCE BEFORE WORKING ON YOUR MARKER. ALWAYS FOLLOW THE MANUFACTURER'S INSTRUCTIONS WHEN USING OR WORKING ON YOUR MARKER. NOT POSSIBLE DAMAGE TO YOUR MARKER. USE THIS PRODUCT AT YOUR OWN RISK.



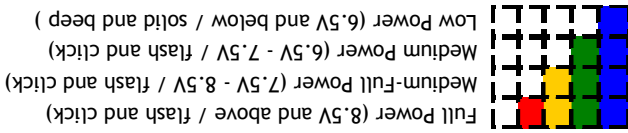
**Firing Mode**  
 Semi — x rounds fired per Trigger Pull (x=2 to 5)  
 Burst — x rounds fired per Trigger Pull (x=2 to 5)  
 Reactive — x rounds fired per Trigger Pull (x=1 to 5)  
 Full Auto — Fires continuously while the trigger is held  
 Rampage 1—Definable Ramping (defaults to a burst ramping mode)  
 Rampage 2—Definable Ramping (defaults to a full-auto ramping mode)  
 PPS3—Three shots in Semi-Automatic then transitions to 3 Round Burst. Returns to Semi-Automatic after 1 second of inactivity.  
 NXT—Semi-Automatic for the first 3 shots, then Full Automatic on the 4th pull and hold. Resets to Semi-Automatic after 1 second of inactivity.



**Firing Mode**  
 Semi  
 Burst  
 Reactive  
 Full Auto  
 Rampage 1  
 Rampage 2  
 PPS3  
 NXT

Your Rampage™ board comes with 8 base firing modes. To change modes, tap the Power Button. Each time the Power Button is pressed, the LED display will change indicating what mode is currently selected. Each firing mode has a corresponding LED identification:

**SELECTING YOUR FIRING MODE**



Full Power (8.5V and above / flash and click)  
 Medium-Full Power (7.5V - 8.5V / flash and click)  
 Medium Power (6.5V - 7.5V / flash and click)  
 Low Power (6.5V and below / solid and beep)

**STARTING YOUR RAMPAGE™ SHOCKER BOARD**  
 To start your new Rampage™ Shocker board, simply press and release the power button on the back of the maker. You will be in firing mode. Your Rampage Shocker board also comes with a built in battery level indicator that can be used when starting your marker. To use the battery level indicator, press and hold the power button. While holding the power button, the LED's will indicate the strength of your battery in bar graph form. When you release the power button, you will be in firing mode.



For technical support or help with your existing product, please contact

SUPPORT@GOAPEONLINE.COM

OR

VISIT OUR FORUMS AT WWW.GOAPEONLINE.COM

Advanced Paintball Electronics  
 P.O Box 125  
 Odessa, Florida 33556-0125

**PRODUCT WARRANTY**

Rampage boards are covered against manufacturer defects for a period of 1 year. We DO NOT warrant the solenoid OR external wiring. If you have any questions, please ask before you purchase our product.

**VOIDING YOUR WARRANTY**

- Improper Installation (we can install your product for you)
- ANY alteration to the Circuit Board or code
- Improper use, misuse, abuse or physical damage
- Mishandling and/or Electro-Static-Discharge (ESD) damage

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 VER 1.1  
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**RAMPAGE™ USERS GUIDE**



**Powered by RAMPAGE!**

# RAMPAGE™ QUICK REFERENCE

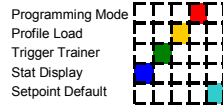
## Legend/Description

- Solid LED Display
- Blinking LED Display



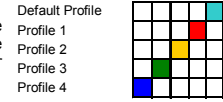
## Startup Options Menu

To access the Startup Options, pull and hold the trigger, power on the marker, then release the trigger. The rapid flickering LEDs indicate you have successfully accessed the Startup Options menu. Use the trigger to scroll to the different Startup Menu options. To select an Option, press and release the Power button.



## Profile Load Menu

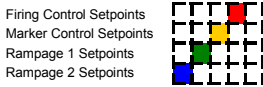
Use the trigger to scroll to the Profile you wish to program. To select the Profile, press and release the Power button.



## Programming Setpoint Menu

To Scroll to the NEXT top level Setpoint Group, pull and release the trigger. To select a Group, Pull and Hold the trigger (Approx. 1 second).

Once a group is selected, the first Setpoint in the group is displayed. To scroll through the Setpoints, pull and release the trigger. To select a Setpoint pull and hold the trigger (Approx. 1 second).



When selected, the Setpoint will "flash" its current value (in blue). To modify the current Setpoint, pull and hold the trigger until the LED stops flashing, then enter the new value via the trigger. Press the Power button to accept the new value. The Blue LED will flash the new value.

To "backup" or "move back" through the programming menu, tap the Power button. To Exit programming mode, press and hold the Power button for 3 seconds. The values will be stored and the marker powered off. Refer to the *Programming Examples* provided herein for more information.

## Eye Control

To toggle your eyes On or Off, press and hold the Power button for 1 second.

- Slow Flash / Overrides Lightbar Mode (unless stealth)
- Fast Flash / Overrides Lightbar Mode (unless stealth)
- Empty Breach Alert (Only if EYES ON)



To power your marker Off, Press and hold the Power button for 3 seconds.

Firing Mode Setpoints	Default	Min/Max
Cap Mode	2	1/2
Max Global Rate of Fire (Eyes ON)	15	10/40
Max Global Rate of Fire (Eyes OFF)	12	10/20
Burst Mode Rounds	3	2/5
Reactive Pull Rounds	1	1/5
Reactive Release Rounds	1	1/5
Tournament Mode (when active)	7	1/8
Group 1 Firing Mode enable	15	1/15
Group 2 Firing Mode enable	15	1/16
Breakout Mode	13	1/13

Marker Control Setpoints	Default	Min/Max
Power Up Profile	5	1/5
Trigger Debounce (ms)	10	2/20
Anti Mechanical Bounce	5	1/20
Solenoid Dwell (ms)	15	1/30
Dwell Modulation (ms)	10	1/20
Bolt Stick Dwell (ms)	16	1/16
Bolt Stick reset time (sec)	15	1/25
Breach Load Delay (ms)	3	1/10
Bolt Return Delay (ms)	35	1/40
Eye Mode	2	1/5
Eye Type	1	1/2
Auto Shut Off (3 min ticks)	3	1/5
LED Controls	1	1/16
Audio Controls	1	1/25

Rampage Mode 1 Setpoints	Default	Min/Max
1st Ramp Mode (semi/burst/reactive/auto)	2	1/4
1st Ramp Mode Rounds	2	1/10
1st Ramp Mode BPS	10	10/40
1st Ramp Point Pull Rate	4	2/10
2nd Ramp Mode (semi/burst/reactive/auto)	2	1/4
2nd Ramp Mode Rounds	3	1/10
2nd Ramp Mode BPS	15	10/40
2nd Ramp Mode Reset Timer	20	1/20
2nd Ramp Point Pull Rate	8	2/10
3rd Ramp Mode (semi/burst/reactive/auto)	2	1/4
3rd Ramp Mode Rounds	4	1/10
3rd Ramp Mode BPS	20	10/40
3rd Ramp Mode Reset Timer	20	1/20

Rampage Mode 2 Setpoints	Default	Min/Max
1st Ramp Mode (semi/burst/reactive/auto)	4	1/4
1st Ramp Mode Rounds	10	1/10
1st Ramp Mode BPS	10	10/40
1st Ramp Point Pull Rate	-	2/10
2nd Ramp Mode (semi/burst/reactive/auto)	4	1/4
2nd Ramp Mode Rounds	10	1/10
2nd Ramp Mode BPS	15	10/40
2nd Ramp Mode Reset Timer	10	1/20
2nd Ramp Point Pull Rate	-	2/10
3rd Ramp Mode (semi/burst/reactive/auto)	4	1/4
3rd Ramp Mode Rounds	-	1/10
3rd Ramp Mode BPS	20	10/40
3rd Ramp Mode Reset Timer	10	1/20

\* These settings are not used with the Auto Firing Mode

## Firing Mode Setpoints

**Cap Mode** – (1 = Uncapped / 2 = Capped). When Uncapped (1), the marker will fire as fast as the marker and hopper can feed. When Capped (2), the max rate of fire will not exceed the MGRF Eyes ON rate (with eyes ON) or the MGRF Eyes OFF rate (when eyes are OFF). **MGRF Eyes ON** – When operating in "Capped" mode, this sets the "Eyes On" Max Global Rate of Fire (in Balls per second) of all firing modes (except ramping). If the Cap Mode is "Uncapped", this value is not used.

**MGRF Eyes OFF** – This sets the "Eyes OFF" Max Global Rate of Fire (in Balls per second) of all firing modes.

**Burst Mode Rounds** – This value sets the number of rounds fired for each trigger pull in Burst Mode.

**Reactive Pull Rounds** – This value sets the number of rounds fired for each trigger pull in Reactive Mode.

**Reactive Release Rounds** – This value sets the number of rounds fired for each trigger release in Reactive Mode.

**Tournament Mode** – Determines what mode will be locked in for Tournament play when the Tourney Mode Lock Switch is ON. Refer to the table below for Mode Values.

Value	Mode
1	Semi
2	Burst
3	Reactive
4	Full Auto
5	Rampage 1
6	Rampage 2
7	PSP3
8	NXL

Activate the Tournament mode by placing the Tourney Switch in the ON position and power cycling the marker. Tournament Mode deactivates the Firing mode selection and caps the rate of fire at 15 BPS. (Semi mode operates UNCAPPED if Cap Mode = 1).

**Group 1 Firing Mode Enable** - Allows you to enable/disable the Group 1 Firing Modes. By default, all modes in this group are enabled. Refer to the Group 1 Firing Mode Table for values.

**Group 2 Firing Mode Enable**—This setting allows you to enable or disable Group 2 Firing Modes. By default, all modes in this group are enabled. Refer to the Group 2 Firing Mode Table for values.

Group 1 Firing Mode enable					Group 2 Firing Mode enable				
Value	Auto	Reactive	Burst	Semi	Value	NXL	PSP3	Ramp2	Ramp1
1	No	No	No	Yes	1	No	No	No	Yes
2	No	No	Yes	No	2	No	No	Yes	No
3	No	No	Yes	Yes	3	No	No	Yes	Yes
4	No	Yes	No	No	4	No	Yes	No	No
5	No	Yes	No	Yes	5	No	Yes	No	Yes
6	No	Yes	Yes	No	6	No	Yes	Yes	No
7	No	Yes	Yes	Yes	7	No	Yes	Yes	Yes
8	Yes	No	No	No	8	Yes	No	No	No
9	Yes	No	No	Yes	9	Yes	No	No	Yes
10	Yes	No	Yes	No	10	Yes	No	Yes	No
11	Yes	No	Yes	Yes	11	Yes	No	Yes	Yes
12	Yes	Yes	No	No	12	Yes	Yes	No	No
13	Yes	Yes	No	Yes	13	Yes	Yes	No	Yes
14	Yes	Yes	Yes	No	14	Yes	Yes	Yes	No
15	Yes	Yes	Yes	Yes	15	Yes	Yes	Yes	Yes
16	No	No	No	No	16	No	No	No	No

**Breakout Mode**—This setting allows you to select several different styles of breakout modes. All shots prior to full auto are semi auto. Refer to the Breakout Mode Table for values. Breakout mode is off by default.

**NOTE—THESE MODES ARE FOR PRACTICE ONLY. THEY ARE ILLEGAL TO USE IN A GAME OR TOURNAMENT.**

Value	Breakout Modes
1	Fires a Full Automatic Burst at MGRF on the 1st Trigger Pull and Hold
2	Fires a Full Automatic Burst at MGRF on the 2nd Trigger Pull and Hold
3	Fires a Full Automatic Burst at MGRF on the 3rd Trigger Pull and Hold
4	Fires a Full Automatic Burst at MGRF + 2bps on the 1st Trigger Pull and Hold
5	Fires a Full Automatic Burst at MGRF + 2bps on the 2nd Trigger Pull and Hold
6	Fires a Full Automatic Burst at MGRF + 2bps on the 3rd Trigger Pull and Hold
7	Fires a Full Automatic Burst at MGRF + 4bps on the 1st Trigger Pull and Hold
8	Fires a Full Automatic Burst at MGRF + 4bps on the 2nd Trigger Pull and Hold
9	Fires a Full Automatic Burst at MGRF + 4bps on the 3rd Trigger Pull and Hold
10	Fires a Full Automatic Burst Uncapped on the 1st Trigger Pull and Hold
11	Fires a Full Automatic Burst Uncapped on the 2nd Trigger Pull and Hold
12	Fires a Full Automatic Burst Uncapped on the 3rd Trigger Pull and Hold
13	Breakout Mode Disabled

## Marker Control Setpoints

**Power Up Profile**— This setting allows you to choose which profile you want your marker to automatically start in when powered on. (1=Red, 2=Yellow, 3=Green, 4=Blue & 5=Teal (Default)).

**Trigger Debounce** – This value sets amount of time (in milliseconds) the trigger must remain inactive prior to accepting a new trigger pull. Lowering this value can cause your marker to fire errantly when making successive trigger pulls. Raising this value will prevent errant firing and provide reliable firing in sync with your trigger pulls.

**Anti Mechanical Bounce**—Used in Semi Automatic Mode only. This trigger filter prevents inadvertent firing due to marker recoil. Raising this value provides more filtering during slow trigger pulls.

**Solenoid Dwell** – This value controls the amount of time (in milliseconds) the solenoid is energized. If too low, the bolt will partially stroke and not fire properly. If the value is too high the valve remains open for too long, wasting air and battery power.

**Dwell Modulation** – This setting allows you to adjust (in milliseconds) how much of the dwell time is modulated (pulsed at 70 KHz). Lower Dwell Modulation times will consume more power when the solenoid is energized. Higher Dwell Modulation times consume less power when the solenoid is energized. Raising this value too high may prevent the solenoid valve from opening altogether.

**Bolt Stick Dwell** – This setting allows you to add additional milliseconds of dwell to your existing dwell setting. This will only affect the first shot fired after the Bolt Stick Reset Time is exceeded. You can add up to 15 milliseconds of dwell or choose a value of 16 (default) to disable the Bolt Stick Dwell setting. You should only use this setting if you experience first shot drop off.

**Bolt Stick Reset Time (seconds)** - This setting allows you to set the amount of time the trigger can remain idle before adding the Bolt Stick Dwell setting. This value is ignored if the Bolt Stick Dwell is disabled.

**Breach Load Delay** – This setpoint establishes the amount of time (in milliseconds) the eyes must see a ball in the breach. This ensures a ball has dropped fully into the breach before the marker fires. This can also compensate for reflective shelled paints.

**Bolt Return Delay** – This setpoint establishes the amount of time (in milliseconds) after firing a round that the marker waits to see the bolt transition back past the eyes. This value can be lowered when using aftermarket high performance bolts. This also establishes the amount of time to recharge for the next shot, and provides the time out period to determine if an eye fault has occurred.

**Eye Mode** - Your Rampage board comes with unmatched Eye control using our exclusive iFault™ technology. iFault™ provides advanced eye logic for your marker. While your eyes are functioning, your marker will fire at the MGRF Eyes ON BPS rate. If your marker's eyes become disabled, iFault™ will switch to the MGRF Eyes OFF BPS rate automatically. If your eye functionality returns, iFault™ will automatically resume firing at the MGRF Eyes ON BPS rate. Refer to the table below for Eye operation values.

Value	Mode
1	Eyes On operation with iFault™ processing ENABLED. - Allows manual Eye On/Off operation via eye pushbutton.
2	Eyes On operation with iFault™ processing DISABLED (factory default) - Allows manual Eye On/Off operation via eye pushbutton.
3	Eye Bypass Mode with iFault™. - Dry firing mode only. - Provides test mode for Bolt Return delay adjustment (via iFault™ alarm) - Marker operates at EYES ON MGRF. - EYES OFF MGRF available via Eye PB tap (displays EYES OFF indicator) - Eye processing bypassed EXCEPT for iFault™ - Bypasses power-up no ball in breach indicator
4	Eye Bypass Demo Mode. - Dry firing mode only. - Marker defaults to EYES ON MGRF. - EYES OFF MGRF available via Eye PB tap (displays EYES OFF indicator) - Eye processing bypassed including power-up "no ball in breach"
5	Eye Disable Mode - Use for broken or missing eyes - All Eye processing and Eye functions disabled - Defaults to EYES OFF MGRF

**Eye Type**— This setting allows you to select the type of eyes that are in your marker. 1=Reflective (Default) and 2=Break Beam

**Auto Shutoff** – This setting allows you to adjust if or when you would like your marker to shut off automatically after no firing activity. Auto Shutoff values range from 2 – 20, with each increment adding 3 minutes of time to the delay. This provides shutoff times from 6 to 60 minutes. A value of 1 defeats the Auto Shutoff feature, and your marker will remain on until you manually shut it off.

**LED Controls** – This setting controls the LED characteristics of your Rampage board. Refer to the table below for LED operation values.

**Audio Controls** – This setting controls the Audio characteristics of your Rampage board. Refer to the table below for Audio operation values.

LED Control Mode enable				Audio Control Mode enable				
Value	Stealth	Fire Mode	Fire LED	Value	iFault	Breach	Program	Button
1	No	No	Yes	1	No	No	No	Yes
2	No	No	Yes	2	No	No	Yes	No
3	No	Yes	Yes	3	No	No	Yes	Yes
4	Yes	No	Yes	4	No	Yes	No	No
5	Yes	No	Yes	5	No	Yes	No	Yes
6	No	Yes	Yes	6	No	Yes	Yes	No
7	No	Yes	Yes	7	No	Yes	Yes	Yes
8	Yes	No	No	8	Yes	No	No	No
9	Yes	No	No	9	Yes	No	No	Yes
10	Yes	No	Yes	10	Yes	No	Yes	No
11	Yes	No	Yes	11	Yes	No	Yes	Yes
12	Yes	Yes	No	12	Yes	Yes	No	No
13	Yes	Yes	No	13	Yes	Yes	No	Yes
14	Yes	Yes	Yes	14	Yes	Yes	Yes	No
15	Yes	Yes	Yes	15	Yes	Yes	Yes	Yes
16	No	No	No	16	No	No	No	No

## Rampage Mode 1 Setpoints

## Rampage Mode 2 Setpoints

**Ramp Mode** – This option determines the firing mode for each stage of ramping. Choose Semi (1), Burst (2), Reactive (3) or Auto (4).

**Ramp Mode Rounds** – This option sets the number rounds that apply to the selected firing mode.

**Semi Mode** - defines the number of rounds to fire at the defined Pull Rate in order to ramp to the next stage.

**Burst Mode** - defines the number of rounds fired for each trigger pull.

**Reactive Mode** - defines the rounds fired for each trigger pull & release.

**Auto Mode** - defines the number of successive rounds fired in order to ramp to the next stage.

**Ramp Point Pull Rate** – This option sets the trigger pull rate required (in Hz / triggers per second) to transition to the next ramping stage. It is not used for Auto Mode operation.

**Ramp Mode BPS** – This option sets the ball per second (BPS) cap rate for the current ramping stage. This value can be set from 10bps to 40bps and relies upon operational eyes. The Ramping BPS rate is overridden by the MGRF Eyes OFF rate if the marker eyes are disabled.

**Ramp Mode Reset Timer** – This option sets the amount of time the trigger can be at rest and yet still remain in the current ramping stage before reverting back to the 1st Ramp Mode. This time value is entered in 10<sup>th</sup>s of a second.



# Powered by RAMPAGE!

Did you know your Rampage™ Shocker board can measure the exact voltage of your battery, track your total shots, track your trigger pulls and monitor your operational efficiency? Get the details in our download section at [www.GoApeOnline.com](http://www.GoApeOnline.com)

# Programming Tutorial for the Rampage™ Board

**WARNING:** Before attempting to Program your Rampage™ board, you MUST remove any air source and cover your barrel with a barrel blocking device. Additionally, be sure there is no hopper attached to the marker and no ball in the breech of the marker to prevent accidental firing. Also, the following steps assume you are at the default setting and you are starting from the power off position.

## TOP LEVEL GROUPS

Your Rampage™ board controls are organized into four Setpoint Groups or Top Level Groups.



THE INDIVIDUAL SETPOINTS ARE ORGANIZED UNDER EACH OF THE TOP LEVEL GROUPS

Rampage Mode 2 Setpoints	Default	Min/Max
1st Ramp Mode (semi/burst/reactive/auto)	4	1/4
1st Ramp Mode Rounds	10	1/10
1st Ramp Mode BPS	10	10/40
1st Ramp Point Pull Rate	*	2/10
2nd Ramp Mode (semi/burst/reactive/auto)	4	1/4
2nd Ramp Mode Rounds	10	1/10
2nd Ramp Mode BPS	15	10/40
2nd Ramp Mode Reset Timer	10	1/20
2nd Ramp Point Pull Rate	*	2/10
3rd Ramp Mode (semi/burst/reactive/active)	4	1/4
3rd Ramp Mode Rounds	*	1/10
3rd Ramp Mode BPS	20	10/40
3rd Ramp Mode Reset Timer	10	1/20

\*These settings are not used with the Auto Firing Mode

Rampage Mode 1 Setpoints	Default	Min/Max
1st Ramp Mode (semi/burst/reactive/auto)	2	1/4
1st Ramp Mode Rounds	2	1/10
1st Ramp Mode BPS	10	10/40
1st Ramp Point Pull Rate	4	2/10
2nd Ramp Mode (semi/burst/reactive/auto)	2	1/4
2nd Ramp Mode Rounds	3	1/10
2nd Ramp Mode BPS	15	10/40
2nd Ramp Mode Reset Timer	20	1/20
2nd Ramp Point Pull Rate	8	2/10
3rd Ramp Mode (semi/burst/reactive/active)	2	1/4
3rd Ramp Mode Rounds	4	1/10
3rd Ramp Mode BPS	20	10/40
3rd Ramp Mode Reset Timer	20	1/20

Marker Control Setpoints	Default	Min/Max
Power Up Profile	5	1/5
Trigger Debounce (ms)	10	2/20
Anti Mechanical Bounce	5	1/20
Solenoid Dwell (ms)	15	8/40
Dwell Modulation (ms)	10	1/20
Bolt Stick Dwell (ms)	16	1/16
Bolt Stick reset time (sec)	15	1/25
Breach Load Delay (ms)	3	1/10
Bolt Return Delay (ms)	30	1/40
Eye Mode	2	1/5
Eye Type	1	1/2
Auto Shut Off (3 min ticks)	3	1/5
LED Controls	1	1/16
Audio Controls	1	1/25

Firing Mode Setpoints	Default	Min/Max
Cap Mode	2	1/2
Max Global Rate of Fire (Eyes ON)	15	10/40
Max Global Rate of Fire (Eyes OFF)	12	10/20
Burst Mode Rounds	3	2/5
Reactive Pull Rounds	1	1/5
Reactive Release Rounds	1	1/5
Tournament Mode (when active)	7	1/8
Group 1 Firing Mode enable	15	1/15
Group 2 Firing Mode enable	15	1/16
Breakout Mode	13	1/13

## Changing Firing Mode Setpoints - MGRF

In this example you will navigate to the Firing Mode Setpoints and change the Maximum Global Rate of Fire (MGRF) when the Marker Eyes are ON to 20 balls per second (bps) from the default of 15bps. Additionally, you will set the MGRF when the Marker Eyes are OFF to 10bps from the default of 12bps.

1		Pull and Hold the Trigger, press and release the Power button, then release the Trigger.
2		The Blinking Red LED indicates you have accessed the Startup Options Menu and are at the first Menu Option—Programming Mode.
3		Press and Release the Power button to enter Programming Mode. The Rear Blue LED on the Power Button will be lit indicating you are at the Default Profile.
4		Press and Release the Power Button to select the Default Profile
5		Since the Firing Mode Setpoints is the first Setpoint Group, Pull and Hold the trigger for 2 Seconds to select it.
6		The Solid Red LED indicates you are at the first setpoint (Cap Mode) under the Firing Mode Setpoints.
7		Pull the trigger one time to scroll to the next Fire Mode Setpoint. The Solid Yellow LED indicates you are at the MGRF Eyes On setting.
8		Pull and Hold the Trigger for 2 seconds to indicate you wish to select this setting. The Blue LED will blink out the current value.
9		Pull and Hold the Trigger for 2 seconds to indicate you want to enter a new value. The Blue LED will go out.
10		Pull the trigger 20 times to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
11		Press and Release the Power button to store the new value. The Blue LED will blink 20 times indicating the new value.
12		Press and Release the Power button one time to go back to the MGRF Eyes ON Setpoint The Solid Yellow LED indicates you are back in the Firing Mode Setpoints-MGRF Eyes On.
13		Pull the Trigger one time to scroll to the next setpoint (MGRF Eyes OFF). The Solid Yellow/Red LED indicates you are at the MGRF Eyes OFF Setpoint.
14		Pull and Hold the Trigger for 2 seconds to indicate you wish to select this setting. The Blue LED will blink out the current value.
15		Pull and Hold the Trigger for 2 seconds to indicate you want to enter a new value. The Blue LED will go out.
16		Pull the trigger 10 times to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
17		Press and Release the Power button to store the new value. The Blue LED will blink 10 times indicating the new value.
18		Press the Power button one time to go back to the MGRF Eyes Off Setpoint.
19		Press the Power button one time to exit to the Top Level or Setpoint Groups. The Blinking Red LED indicates you are at the Top Level Setpoint Group—Firing Controls.
20		Press and Hold the Power button for 3 seconds to Store all changes and power off the marker. All four LEDs will flash indicating you are powering down.

## Changing Marker Control Setpoints - Dwell

In this example you will navigate to the Marker Control Setpoints and change the Dwell to 12ms from the default of 15ms. **Note: It is important to know what solenoid is in your marker. There are two types of solenoids that can be in your marker. Depending on the solenoid, you will need to adjust your Solenoid Dwell times. Here are some suggested values for both types using a stock marker:**

Parker Solenoid Dwell 9 to 12 milliseconds

Humphrey Solenoids Dwell 13 to 17 milliseconds

1		Pull and Hold the Trigger, press and release the Power button, then release the Trigger.
2		The Blinking Red LED indicates you have accessed the Startup Options Menu and are at the first Menu Option—Programming Mode.
3		Press and Release the Power button to enter Programming Mode. The Rear Blue LED on the Power Button will be lit indicating you are in the Default Profile.
4		Press and Release the Power Button to select the Default Profile
5		Pull the trigger to scroll to the next top level menu Marker Control Setpoint. The Blinking Yellow LED indicates you are in the Marker Control Setpoints.
6		Pull and Hold the trigger for 2 Seconds to select it. The solid Red LED indicates you are at the first Setpoint - Power Up Profile under the Marker Control Setpoints.
7		Pull the trigger to scroll to the next Setpoint - Trigger Debounce; indicated by a solid Yellow LED
8		Pull the trigger to scroll to the next Setpoint - Anti Mechanical Bounce; indicated by a solid Yellow/Red LED
9		Pull the trigger to scroll to the next setpoint - Solenoid Dwell; indicated by a solid Green LED
10		Pull and Hold the Trigger for 2 seconds to indicate you wish to select this setting. The Blue LED will blink out the current value.
11		Pull and Hold the Trigger for 2 seconds to indicate you want to enter a new value. The Blue LED will go out.
12		Pull the trigger 12 times to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
13		Press and Release the Power button to store the new value. The Blue LED will blink 12 times indicating the new value.
14		Press the Power button one time to go back to the Solenoid Dwell Setpoint.
15		Press the Power button one time to exit to the Top Level or Setpoint Groups. The Blinking Yellow LED indicates you are at the Top Level Setpoint Group—Marker Controls.
16		Press and Hold the Power button for 3 seconds to Store all changes and power off the marker. All four LEDs will flash indicating you are powering down.

## Reset ALL values to their default settings

The following steps will reset all marker values to their default settings. Using these steps will also reset any profiles or user definable ramping you may have created or saved.

1		Pull and Hold the Trigger, press and release the Power button, then release the Trigger.
2		The Blinking Red LED indicates you have accessed the Startup Options Menu and are at the first Menu Option—Programming Mode.
3		Pull and Release the Trigger 4 times to scroll to the Menu Option—Setpoint Default indicated by the Blinking Blue Power button LED.
4		Press and Release the Power button to Reset your Rampage board to its default configuration. All four LEDs will flash indicating you have reset your Rampage™ Board to its factory default configuration.



Be sure to check out the download section on our web site for more programming examples, tips and updates! [www.GoApeOnline.com](http://www.GoApeOnline.com)



## Using Profiles

Your Rampage™ board has the ability to store up to 5 programmable profiles. The default profile is used whenever you turn on the maker. By invoking a startup sequence, you can easily switch between the 4 additional profiles. A profile is a complete clone of your marker settings. Therefore, a profile consists of ALL Setpoints including your definable ramping modes. Profiles allow you to instantly re-program your marker. The following steps will guide you through modifying the Red profile to change the available firing modes. Even though this example only changes one Setpoint, keep in mind that you can change ANY number of Setpoints and store them in your profile.

1		Pull and Hold the Trigger, press and release the Power button, then release the Trigger.
2		The Blinking Red LED indicates you have accessed the Startup Options Menu and are at the first Menu Option—Programming Mode.
3		Press and Release the Power button to enter Programming Mode. The Rear Blue LED on the Power Button will be lit indicating you are in the Default Profile. Pull and Release the Trigger one time to scroll to the Red Profile.
4		Press and Release the Power Button to select the Red Profile
5		Pull and Release the Trigger 7 times to scroll to the Group 1 Firing Mode Enable Setpoint indicated by the Solid Blue LED. Pull and Hold the trigger for 2 Seconds to select it.
8		Pull and Hold the Trigger for 2 seconds to indicate you wish to select this setting. The Blue LED will blink out the current value.
9		Pull and Hold the Trigger for 2 seconds to indicate you want to enter a new value. The Blue LED will go out.
10		Pull the trigger 1 time to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
11		Press and Release the Power button to store the new value. The Blue LED will blink 1 time indicating the new value.
12		Press and Hold the Power button for 3 seconds to Store all changes and power off the marker. All four LEDs will flash indicating you are powering down.

## Starting in a Profile

To start your marker using the settings in the 1<sup>st</sup> or Red Profile do the following:

1		Pull and Hold the Trigger, press and release the Power button, then release the Trigger.
2		The Blinking Red LED indicates you have accessed the Startup Options Menu and are at the first Menu Option—Programming Mode.
3		Pull and Release the Trigger to scroll to the next Menu Option—Profile Load indicated by the Blinking Yellow LED.
4		Press and Release the Power button to select this Menu Option. The Solid Red LED indicates you are at the Red Profile.
5		Press and Release the Power button to select this profile
6		The Rampage board will instantly reconfigure to the settings in the Red profile and startup in firing mode.

Your marker will now be operating under the Red profile. In the previous exercise we disabled the Burst, Reactive and Full Automatic firing modes. To test that your programming is correct, first you must satisfy the “no ball in breech” alert. You can simply drop a ball in the breech or stick your finger in the breech to satisfy the alert. Once that is complete, the solid Red LED will be displayed indicating you are in the Semi Automatic firing mode. Press and Release the Power button to scroll to the next firing mode. Since the Burst (solid Yellow Led), Reactive (solid Green LED) and Full Auto (solid Blue LED) have been disabled, the next firing mode Rampage 1 (blinking Red) should be displayed. As you keep pressing the Power button to scroll through the available firing modes you will see you only have the five remaining modes available.

## Ramping Worksheet

This tool is provided to help you pre-determine the settings for Rampage Ramping Modes.

1st Ramp Mode	Semi	Burst	Reactive	Auto
1st Ramp Mode Rounds	(Shots) 1 to 10	(Pull) 1 to 10	(Pull & Release) 1 to 10	(Pull & Hold) 1 to 10
1st Ramp Mode Pull Rate	2 - 10 hz	2 - 10 hz	2 - 10 hz	n/a
1st Ramp Mode BPS	10 - 40 bps	10 - 40 bps	10 - 40 bps	10 - 40 bps
2nd Ramp Mode	Semi	Burst	Reactive	Auto
2nd Ramp Mode Rounds	(Shots) 1 to 10	(Pull) 1 to 10	(Pull & Release) 1 to 10	(Pull & Hold) 1 to 10
2nd Ramp Mode Reset Timer	.1 to 2.0	.1 to 2.0	.1 to 2.0	.1 to 2.0
2nd Ramp Mode Pull Rate	2 - 10 hz	2 - 10 hz	2 - 10 hz	n/a
2nd Ramp Mode BPS	10 - 40 bps	10 - 40 bps	10 - 40 bps	10 - 40 bps
3rd Ramp Mode	Semi	Burst	Reactive	Auto
3rd Ramp Mode Rounds	n/a	(Pull) 1 to 10	(Pull & Release) 1 to 10	n/a
3rd Ramp Mode Reset Timer	.1 to 2.0	.1 to 2.0	.1 to 2.0	.1 to 2.0
3rd Ramp Mode BPS	10 - 40 bps	10 - 40 bps	10 - 40 bps	10 - 40 bps

Note - Pull rate is not used when Full Auto Mode is set / Matrix value is 1 for combination calc

	Rampage 1	Rampage 2
Input 1	1st Ramp Mode	
Input 2	1st Ramp Mode Rounds	
Input 3	1st Ramp Mode BPS	
Input 4	1st Ramp Mode Pull Rate	
Input 5	2nd Ramp Mode	
Input 6	2nd Ramp Mode Rounds	
Input 7	2nd Ramp Mode BPS	
Input 8	2nd Ramp Mode Reset Timer	
Input 9	2nd Ramp Mode Pull Rate	
Input 10	3rd Ramp Mode	
Input 11	3rd Ramp Mode Rounds	
Input 12	3rd Ramp Mode BPS	
Input 13	3rd Ramp Mode Reset Timer	

## How to Determine Your Markers Mechanical Maximum Rate of Fire

Like the Speedometer on your car, just because it shows a maximum speed of 150 mile per hours doesn't mean it can actually go that fast. Several factors need to be considered when determining your markers top end balls per second (BPS) speed. Some factors include physical upgrades such as aftermarket bolts, etc. In addition to Physical changes, Marker adjustments to Dwell and Bolt Return Delay will determine your maximum rate of fire.

To determine your markers top BPS rate, you must first establish the minimum values for the Bolt Return Delay and Dwell. Based on the default values, your marker will operate from 10 to 18 bps with no changes to the Bolt Return Delay or Dwell. Since aftermarket upgrades will make these settings different from marker to marker, you will need to determine the values particular to your marker. First, establish the minimum Dwell time which your marker will operate consistently. This is essentially a trial and error process. Once your minimum Dwell time has been determined, follow the same process with your Bolt Return Delay setting. Once you have determined your minimum Bolt Return Delay value, complete the following formula to determine your markers top BPS rate of fire.

The Table below uses a simple formula using the following calculation:

$$1000 \div (\text{Solenoid Dwell} + \text{Bolt Return Delay}) = \text{Maximum Rate of Fire}$$

## Bolt Return Delay (in Milliseconds)

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
5	66.7	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2
6	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7
7	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3
8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8
9	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4
10	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0
11	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6
12	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2
13	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9
14	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5
15	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2
16	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9
17	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5
18	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2
19	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9
20	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7
21	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4
22	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1
23	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9
24	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6
25	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4
26	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2
27	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2	14.9
28	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2	14.9	14.7
29	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2	14.9	14.7	14.5
30	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2	14.9	14.7	14.5	14.3

## Maximum Rate of Fire (in BPS)