# Shockwave Marker Board Instructions
Fits Axe and Mini Markers

LED INDICATION
The LED indicator, located above the button, is used to indicate the current Break Beam Sensor System status, the Battery Life Indicator and Trigger Pull indication. The Break Beam Sensor Status is indicated by the blinking frequency of the LED (See Section 7 for further explanation). If the trigger is being pressed the LED will glow a dim RED which can be seen between blinks of the LED.
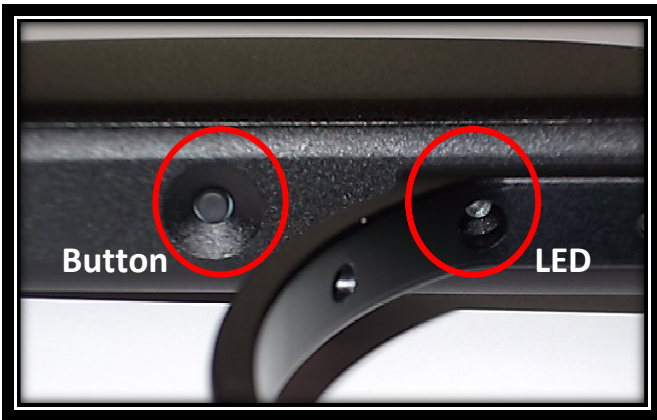
BATTERY LIFE INDICATOR
The AXE also has a Battery Life Indicator, the LED located on the back of the fore-grip. If in standard operation and the LED flashes with a GREEN color, then the battery is Good. If the LED flashes YELLOW/AMBER, then the battery is fairly depleted and should be replaced soon. If the LED flashes RED, the there is less than 20% of the full battery strength remaining and should be replaced immediately.

Battery Level is indicated by the color of the LED (see table below for explanation)

NOTE: During rapid firing, the battery can be depleted quickly and the LED may change color and give an incorrect reading. Allow time for the battery to recover before determining if the battery life is good or truly depleted.

LED Color	Battery Level
GREEN	Battery Good
YELLOW/AMBER	Low Battery, should replace
RED	Battery depleted replace immediately

SWITCHING ON YOUR AXE
To switch the AXE On, locate the button on the back side of the front foregrip, in front of the trigger guard and directly under the LED. Push and hold the button for 2 seconds. The LED will glow solid RED as soon as the button is pressed. Continue to hold the button until the LED glows solid GREEN. Release button and the LED will intermittently flash indicating that the marker is now ON and LIVE in FIRE Mode. Color will be determined by the battery level, as listed in the chart above.

NOTE: Be sure not to have the trigger pressed when turning the board on, this will enter the board into Settings Mode.

SWITCHING OFF YOUR AXE
Push and hold the button on the front foregrip. After the button is held for 2 seconds, the LED will turn to a solid RED color. Release button and the AXE will switch Off.

AUTOMATIC OFF FEATURE
The Axe also has an "Automatic OFF" feature. If you leave your Axe powered up, it will shut itself off after approximately 60 minutes of inactivity. This time cannot be adjusted

FIRING THE AXE
Keep your finger out of the trigger guard and away from the trigger, point the muzzle of your marker in a safe direction at all times during this process. Be sure your goggles are securely in place and make sure the AXE marker is off.

Warning- Everyone within firing range should always use paintball approved eye and face protection in the presence of live paintball markers.

- Place the empty loader onto the marker.
- Be sure that it is securely mounted in place.
- Apply the compressed gas, pressurizing the marker.
- Put the paintballs into the loader.
- Remove the barrel plug, sock or barrel-blocking device.
- Aim the AXE in a safe direction.
- Turn the AXE ON: Push the button for 2 seconds until the LED light changes to solid GREEN, then release button and LED should display a flashing LED according to Eye Status.
- Aim the AXE at the target.
- Pull the trigger with a smooth squeezing motion.

BREAK BEAM EYES OPERATION
The AXE uses a break beam eye system to determine the absence or presence of a paintball for the purposes of reduced paint breakage and optimum rates of fire. When the Break Beam System is activated the marker will not fire unless the Break Beam Eye System detects a paintball. The AXE board is pre-programmed to activate the eye system each time the marker is powered up.

To turn the eyes OFF, ensure that there are no paintballs in the AXE breech or feed-neck, make sure the marker is switched On, and then press the button once. A fast, flashing LED will indicate that the eye system has been deactivated.

To turn the eyes back ON, tap the button one time.

A slow consistent single blinking Green LED indicates that the eyes are ON with no ball in the breech and a double blink LED indicates that there is a ball in the breech.

If the Break Beam Eye System malfunctions, the marker assumes there was a ball broken and the Rate of Fire (ROF) is limited to 8.0 balls-per-second (bps) to prevent further ball breaks. The LED indicator will flash slowly. Turn the Break Beam Eye System OFF to allow firing at Max ROF cap setting.

Break Beam Sensor Status is indicated by blinking frequency of the LED (See table below for explanation). Color would be determined by battery level, as listed in the chart above.

Blink Frequency	Break Beam (BB) Eye Status
Single Blink	BB Sensor System active, no ball in breech
Double Blink	BB Sensor System active, ball in breech
Flashing	BB Sensor System has malfunctioned
Fast Flashing	BB Sensor System Deactivated

For optimal performance of the AXE eyes, keep the inside of the AXE breech clean and clear of broken paint, paint residue, or other debris. Although the eyes can be cleaned via cleaning the breech of the AXE marker, if the eye board needs to be accessed, please follow the steps outlined in the Main Body Assembly section of this manual.

TRIGGER PULL INDICATION
If the trigger is being pressed, the LED will display a dim Red LED which can be seen between blinks of the Eye Setting LED.
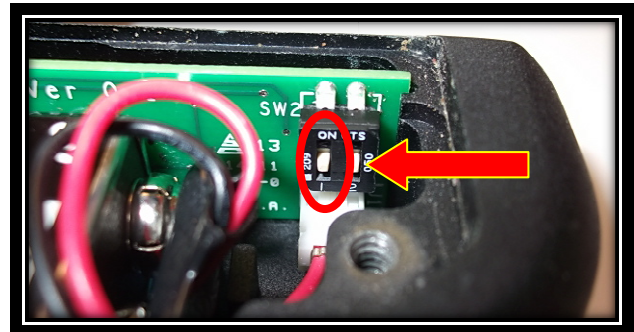
BOARD SETTINGS AND FUNCTIONS
The electronic board features several modes and functions that are listed below. The board is located inside the front foregrip of the marker. Before changing or adjusting any of the board functions, remove the propellant source from the AXE and install a barrel blocking device.

The board inside your AXE features 4 firing modes and 6 adjustable functions. It uses a 3 color LED indicator on the backside of the front foregrip to indicate functions and modes during programming.

TOURNAMENT LOCK
Tournament lock is a feature that prevents the marker from entering the Settings Mode while in the field, to allow the marker to be tournament legal. See your tournament's rule book for an explanation on what is required to lock your marker. Tournament Lock can be turned on/off by using the dip switch 1 located on the inside of the fore grip near the bottom of the circuit board. The battery door must be removed to access the switch. Flip dip switch #1 to the ON (UP when laying flat) position to activate the Tournament Lock. When tournament lock is ON, Settings Mode cannot be activated

SETTINGS MODE
The AXE must be Off and the Tournament Lock must be Off to begin managing the settings and functions. To activate the marker in Settings Mode, press and hold the Trigger, then press and hold the button on the back side of the fore grip. The LED will cycle through an array of colors to indicate the Settings mode is active. You may now release the trigger and the button. Once the LED is done cycling you are ready to navigate through settings mode.

NAVIGATING THROUGH SETTINGS
Once in Settings Mode, use the trigger is used to navigate to the next setting, where the LED indicates which setting as listed in the chart above. Pressing and releasing the trigger quickly will navigate to the next setting. The LED color/status will change accordingly.
Example: If currently in Firing Mode (solid Red), press and release the trigger 3 times to get to De-Bounce (flashing Red).

LED	Setting
Solid Red	Firing Mode
Solid Green	Max ROF
Solid Amber	Dwell
Flashing Red	De-Bounce
Flashing Green	Ball In Place
Flashing Amber	Ramp Start
Fast Flashing Red	Ramp Sustain

CHANGING SETTINGS

To change a setting, first navigate to the setting you would like to change by using the trigger as described above. Once at the desired function, press and hold the trigger for 2 seconds. The LED will then begin blinking to indicate the setting's current value. Once the blinking stops, the LED will turn off and you have a 3 second window to begin entering a new value. Press and release the trigger the number of times corresponding to the desired new setting value. After the desired number is reached, release the trigger and after 3 seconds the LED will cycle through an array of colors to indicate the setting is saved. If you do not enter any trigger pulls to modify a setting, the value remains the same. If you enter more than maximum amount of trigger pulls for any setting, the value will become the maximum value for that setting.

Power off the marker to exit the Settings Mode. Any setting that was modified will be stored and ready to use upon startup.

FIRING MODES
-WILL BE INDICATED BY SOLID RED LED

You must be in the Settings Mode to change Firing Modes, see above for instructions on how to enter Settings Mode. After choosing Firing Modes (Solid Red), hold the Trigger, the LED will blink a Red LED equal to the current setting, followed by a pause. Pull the trigger the number of times equal to your new desired setting (see chart below). Once done, the LED will cycle through an array of colors to indicate the setting is saved and return to the Settings Mode.

There are 4 firing modes available: NPPL/Semi Auto, PSP/Burst, Millennium/Ramp, and NXL Style Full Auto.

IMPORTANT: *When the Firing Mode is changed it will also automatically modify the corresponding Max Rate of Fire and ramping parameters that correspond to that mode. These settings may be changed after Firing Mode is selected*

# of Blinks	Mode
1	NPPL/Semi
2	PSP/Burst
3	Mill/Ramp
4	Full Auto

NPPL/Semi Auto: Marker will shoot 1 time for each time the trigger is pulled. The default setting meets 2011 NPPL marker rules.
Default: Max ROF = 15.0bps

PSP/Burst: Marker will shoot in semi-auto mode equal to the number of shots specified by the Ramp Start setting (see below for more information), then will go into a 3-shot burst at the Max ROF setting. If the marker is not fired for 1 second, the marker will shoot semi-auto until Ramp Start is again achieved. The default setting meets 2011 PSP marker rules.
Default: Max ROF = 12.0bps; Ramp Start=3shots

Millennium/Ramping: Marker will shoot in semi-auto mode equal to the number of shots specified by the Ramp Start setting, and if the Ramp Sustain ROF (see below for more information) is achieved, the marker will ramp up to the Max ROF setting. If the marker is not fired for 1 second the marker will shoot semi-auto until ramping parameters are achieved. The default setting meets 2011 Millennium marker rules.
Default: Max ROF = 10.0bps; Ramp Start = 3shots;
Ramp Sustain = 6tps(trigger pulls per second)

NXL Style Full Auto: Marker will shoot in semi-auto mode equal to the number of shots specified by the Ramp Start setting, then will go into full automatic mode as long as the trigger is held down. If the marker is not fired for 1 second the marker will then shoot semi-auto again until Ramp Start is achieved again
Default: Max ROF=12.0bps; Ramp Start = 3shots

MAX RATE OF FIRE (ROF)
-WILL BE INDICATED BY SOLID GREEN LED

This setting controls the maximum number of paintball per second the marker is allowed to fire. The setting can be varied from 8 to 20 balls per second (bps) in 0.5bps intervals. Use the chart below to set the Max ROF.
Default: Max ROF = 15.0 bps

You must be in the Settings Mode to change the Max ROF, see above for instructions on how to enter Settings Mode. After choosing Max ROF Mode (Solid Green), hold the Trigger to get into the Mode, the LED will blink a GREEN LED equal to the current setting, followed by a pause. Pull the trigger the number of times equal to your new desired setting (see chart below). Once done, the LED will cycle through an array of colors to indicate the setting is saved and return to the Settings Mode.

Example: *10 LED blinks = 12.5 BPS*

# of Blinks	BPS value	# of Blinks	BPS value	# of Blinks	BPS value
1	8.0	10	12.5	18	16.5
2	8.5	11	13.0	19	17.0
3	9.0	12	13.5	20	17.5
4	9.5	13	14.0	21	18.0
5	10.0	14	14.5	22	18.5
6	10.5	15	15.0	23	19.0
7	11.0	16	15.5	24	19.5
8	11.5	17	16.0	25	20.0
9	12.0				

DWELL SETTING

- WILL BE INDICATED BY SOLID AMBER LED

This setting controls the amount of time the solenoid valve is left open. A setting too high will waste excess gas and affect efficiency. A setting too low will prevent marker from operating properly. It is not recommended to change this setting unless you are an experienced user. Minimum dwell time is 3.0ms and is increased in .5ms increments up to 10ms. Use the chart below to set the Dwell.

Default: Dwell = 8.0 ms

You must be in the Settings Mode to change the Dwell Setting, see above for instructions on how to enter Settings Mode. After choosing Dwell Setting (Solid Amber), hold the Trigger to get into the Mode, the LED will blink an Amber LED equal to the current setting, followed by a pause. Pull the trigger the number of times equal to your new desired setting (see chart below). Once done, the LED will cycle through an array of colors to indicate the setting is saved and return to the Settings Mode.

# of Blinks	Dwell in ms	# of Blinks	Dwell in ms
1	3.0	8	6.5
2	3.5	9	7.0
3	4.0	10	7.5
4	4.5	11	8.0
5	5.0	12	8.5
6	5.5	13	9.0
7	6.0	14	9.5
8	6.5	15	10.0

TRIGGER DE-BOUNCE

- WILL BE INDICATED BY A FLASHING RED LED

Time in milliseconds the trigger pull must be released before the next trigger pull can be registered. This eliminates electronic noise and vibrations ("Trigger Bounce") that the board may wrongly interpret as a trigger action (trigger pull) and fire the marker. A higher setting will reduce the bounce. A lower setting will allow for more bounce. One blink corresponds to 1ms of De-Bounce time. De-Bounce is adjustable from 1-15ms in 1.0ms increments.

Default: De-Bounce = 5.0 ms

You must be in the Settings Mode to change the De-Bounce Setting, see above for instructions on how to enter Settings Mode. After choosing De-Bounce Setting (Flashing Red), hold the Trigger to display the value, the LED will show flashing Red LED blinks equal to the current value, followed by a pause. Pull the trigger the number of times equal to your new desired setting, one pull per desired setting equal to each millisecond. Once done, the LED will cycle through an array of colors to indicate the setting is saved and return to the Settings Mode.

BALL IN PLACE (BIP) DELAY

- WILL BE INDICATED BY A FLASHING GREEN LED

Time in milliseconds the ball must stay in breech before it can be fired. Increase this setting for slower feeding loaders to avoid chopping balls in the breech. Faster force feed loader systems may allow for a lower setting to help achieve higher rates of fire. BIP Delay is adjustable from 1-40ms in 1.0ms increments.

Default: BIP Delay = 5.0ms

Note: *If you are not using a force-feed loader, it is recommended that you use a higher BIP setting.*

You must be in the Settings Mode to change the BIP Delay Setting, see above for instructions on how to enter Settings Mode. After choosing BIP Delay (Flashing Green), hold the Trigger to get into the Mode, the LED will show flashing Green LED blinks equal to the current setting, followed by a pause. Pull the trigger the number of times equal to your new desired setting, one pull per desired setting equal to each millisecond. Once done, the LED will cycle through an array of colors to indicate the setting is saved and return to the Settings Mode.

RAMP START

- WILL BE INDICATED BY A FLASHING AMBER LED

This setting controls the amount of semi-automatic shots must be fired before ramping will start. If the marker is not fired for 1 second the count will start over. Ramp Start is adjustable from 1-12 shots in 1 shot increments.

Default: Ramp Start = 3 Shots

You must be in the Settings Mode to change the Ramp Start Setting, see above for instructions on how to enter Settings Mode. After choosing Ramp Start (Flashing Amber), hold the Trigger to get into the Mode, the LED will show flashing Amber LED blinks equal to the current setting, followed by a pause. Pull the trigger the number of times equal to your new desired setting, one pull per desired setting equal to one shot. Once done, the LED will cycle through an array of colors to indicate the setting is saved and return to the Settings Mode.

RAMP SUSTAIN

- WILL BE INDICATED BY A FAST FLASHING RED LED

This settings controls the amount of trigger pulls per second (TPS) that must be achieved and sustained for ramp to kick in. Ramp Sustain is adjustable from 1-12 trigger-pulls-per-second (tps) in 1 tps increments.

Default: Ramp Sustain = 3 tps

You must be in the Settings Mode to change the Ramp Sustain Setting, see above for instructions on how to enter Settings Mode. After choosing Ramp Sustain (Fast Flashing Red), hold the Trigger to get into the Mode, the LED will show fast flashing Red LED blinks equal to the current setting, followed by a pause. Pull the trigger the number of times equal to your new desired setting, one pull per each TPS. Once done, the LED will cycle through an array of colors to indicate the setting is saved and return to the Settings Mode.

NOTE: *This setting affects only Millennium/ Ramp Firing Mode.*

FACTORY RESET

The board has a feature that allows the user to reset all of the settings back to the stock configuration. Tournament Lock must be off to perform factory reset. The following steps are required to perform a Factory Reset:

1. With board Off, turn marker On in settings mode.
2. Press and hold the button on the fore grip, then press and hold the trigger so that both the button and trigger are being held simultaneously (Note – button must be pressed first).
3. Hold both the button and trigger for approximately 5-6 seconds. The LED will then start alternating green and red. Now release the button and trigger.
4. When the board is done resetting the board will turn off.

Troubleshooting Guide

DOESN'T FIRE
Make sure the marker is turned on.
Check the LED light on the back of the foregrip. The LED should be lit when the marker is powered ON.

Trigger may need to be adjusted.
Check the LED light on the back of the foregrip. If the trigger is being pressed, the LED will display a dim Red LED which can be seen between blinks of the Eye Setting LED, and not be Red when the trigger is released. If it is not that way, then the trigger may need to be adjusted. See the "Adjusting your trigger" section earlier in the manual.

DOESN'T FIRE WITH EYE TURNED OFF
Trigger may need to be adjusted.
Check the LED light on the back of the foregrip. While holding in the trigger, the LED should stay red in the background, and not be red when the trigger is released. If it is not that way, then the trigger may need to be adjusted. See the "Trigger Adjustments" section earlier in the manual.