

# ***Dynasty Shocker Board Instructions***

## **Features**

- Scans the trigger over 100,000 times per second
- Unlimited rate of fire while the eyes are enabled
- Adjustable ABS programming prevents first shot drop off
- Adjustable AMB algorithms help to eliminate mechanical bounce
- Power efficient software lengthens battery life
- Programming mode allows changes to debounce, dwell, loader delay, AMB, ABS, and back pulse timing
- All settings are stored in non-volatile memory so they are not lost when power is disconnected
- One touch startup makes the marker ready to fire instantly with the eyes enabled
- Automatic 10 minute power down prevents accidental wasted batteries
- Force shot function allows the marker to be fired when the eyes are enabled but no object is present in the breech

## **Installation**

1. Remove the grips from the grip frame.
2. Push out the two steel retaining pins that are slightly below and forward of the top grip screw.
3. Unplug the battery from the stock board's wiring harness.
4. Gently pull back on the top half of the stock board so the trigger switch can clear the frame.
5. Rotate the stock board out of the frame to one side starting from the bottom of the board.
6. Unplug the 10 wire connector from the back of the stock board.
7. Plug the 10 wire connector into the Dynasty board.
8. Insert the Dynasty board into the frame, starting with the top half that has the trigger switch. The trigger switch should face the trigger.
9. Rotate the Dynasty board into the frame. The edge of the Dynasty board slides into a retaining slot at the bottom of the grip frame.
10. Look through the two retaining pin holes and line up the trigger switch. Insert the two steel retaining pins into the frame and through the trigger switch mounting holes.
11. Plug the battery into the Dynasty board's wiring harness.
12. Make sure the 10 wire cable is tucked up out of the way of the power switch and insert the battery into the frame.
13. Put the grips back on the frame.

## **Power Operation**

Pressing and releasing the power button turns the marker on, instantly making it ready to be fired, showing a blue led in the grip frame. To turn it off, press and hold the power button until the led turns off or stops blinking, then release. Every time the marker is turned on the eyes are enabled. The marker can be turned off regardless of the state of the eyes.

## Eye Operation

The eyes are always enabled when the marker is first turned on. To toggle the eyes on and off push and release the power button quickly. The led will change from a solid blue to a blinking blue to indicate the eyes are disabled. If at any time the eyes become completely blocked while they are enabled the rate of fire will be capped to prevent additional chopping.

## Programming

While the marker is turned off, push the side mounted switch on the circuit board. This will initiate the programming mode, showing solid green on the programming LED located on the backside of the board.

Pulling and releasing the trigger quickly will toggle between the different programming modes:

Green - debounce  
Purple - dwell  
Orange - loader delay  
Blue - AMB  
Red - ABS dwell  
White - back pulse

While the led is lit for the desired setting you would like to change, press and hold the trigger until the led goes out.

When you release the trigger, the led will show the current setting by blinking. For instance, if the current setting for debounce is 5, the led will blink green 5 times. Once the led stops blinking, you have 2 seconds to begin entering the new setting.

To enter the new setting, pull the trigger the desired number of times. For instance, to set the debounce to 2, you would pull the trigger 2 times.

After all settings have been changed to the desired amounts, turn the marker off using the power button.

## Programming Example:

If you wanted to set the dwell to 12, you would:

1. Make sure the marker is powered off.
2. Open the left side of the grips.
3. Push the side mounted programming switch.
4. The programming led shows green. This is the debounce mode.
5. Pull and release the trigger one time quickly to switch to the dwell mode. The led is showing purple.
6. Pull and HOLD the trigger until the led turns off.
7. Release the trigger. The led will blink out the current setting.
8. When the led stops blinking, enter the new setting by pulling the trigger 12 times.
9. Wait until the led turns back on, indicating programming has completed.
10. Turn the marker off using the power button.

## Settings

**Debounce** – An adjustable number of microcontroller cycles after each trigger pull and release where the state of the trigger switch must remain consistent before the software starts looking for additional trigger activity. Setting this too low may cause trigger bounce, leading to falsely generated shots. The default is 5 and may be set from 1 to 50.

**Dwell:** This is the amount of time that the solenoid is energized during each firing cycle. If you experience drop off or your bolt will not cycle completely then turn the dwell up. Greater efficiency and faster firing rates are achieved by lowering the dwell. The default is 10 milliseconds and may be set from 1 to 20.

**Loader Delay:** This adds a slight delay after the eye has seen a ball and the bolt is cycled, causing the gun to fire. If not using force fed loaders it may be necessary to increase this setting to prevent chopping. A setting of 1 essentially means no loader delay, which is the fastest. The default is 1 and may be set from 1 to 50.

**AMB:** This setting allows the user to adjust the anti-mechanical bounce feature. Mechanical bounce occurs with the shocker due to the kick generated during each shot and can cause the marker to “run away”, firing even after the trigger has been let go. AMB helps stop markers from going full auto when the trigger is pulled very slowly. The default is 10 and may be set from 1 to 25. A setting of 1 disables AMB.

**ABS Dwell:** This setting adjusts how much additional dwell time is added when an anti-bolt stick shot takes place. If a marker is left sitting for 10 seconds, the next shot fired will be ABS enabled, and will add the ABS Dwell setting to the Dwell to ensure that there is no low shot. Depending on your bolt setup this shot may have a slightly higher velocity. The default is 5 milliseconds additional dwell and may be set from 1 to 10. A setting of 1 disables ABS.

**Back Pulse:** This is the delay after the dwell time before another shot can begin **when the eyes are disabled**. When the eyes are turned on, the rate of fire is unlimited. To calculate the rate of fire while the eyes are disabled, you can use this formula:

$$1000 / (\text{dwell} + \text{back pulse})$$

For instance, if your dwell is 10 and your back pulse is 50, your maximum rate of fire while the eyes are turned off is 16.67 balls per second.

The default is 50 milliseconds and may be set from 20 to 100.

## Additional Notes

**Force shot feature**— in the event that the eyes are enabled, the breech is empty, and the user wants to fire a clearing shot, a force shot can be initiated by pulling and holding the trigger for ½ second. This is useful with force fed loaders that sometimes push a ball slightly into the detents where the eyes are unable to see it. After force firing the next ball will load and operation can continue as normal.

**A tip for setting the debounce and AMB** – Although AMB is meant as a safety feature to stop run-away markers, it also has the unfortunate side effect of hiding bounce. To test your marker for bounce, shoot it as fast as possible with a single finger. If you have bounce you’ll see and hear double shots for individual pulls. This means you need to turn up your debounce. The slow pull test in use by some judges is not realistic for finding guns that have the debounce set too low.

**A tip for setting the dwell and ABS dwell** – Lower dwell times will decrease the sound output and increase the efficiency of a Shocker. Try turning down the dwell 1 millisecond at a time until the marker will no longer cycle, then go back up. Now shoot with paint over a chronograph. After setting it around 290-300 feet per second, watch the consistency while shooting slow, and see if there is drop off while shooting fast. If you experience greater than a 20 feet per second swing or you have drop off while shoot fast, increase the dwell until this goes away. Your ABS dwell time is the additional dwell time added when an ABS shot occurs. If you leave your marker on and not firing for 10 seconds, ABS will kick in for the next shot, adding the ABS dwell time to the existing dwell setting. For instance, if the dwell is set to 8 milliseconds and the ABS dwell is set to 5 milliseconds, an ABS shot will fire with a 13 millisecond dwell time. Additional shots will use the 8 millisecond dwell time until the marker has not been fired for another continuous 10 seconds. This setting is adjustable so you can tune it to fit your particular marker. Some Shockers don’t experience bolt stick, while others have it horribly. It is recommended to try the default setting at 5 milliseconds. If you encounter bolt stick even when the ABS kicks in, up the setting until it goes away. Stock bolts

will almost always fire a slightly higher velocity shot with ABS, but the HE and Evolve bolts will not if their o-rings are in good condition.