

# Rabid Technologies

## Angel One Board Preliminary Instructions v1.0

### INTRODUCTION

Thank you for purchasing a Rabid Angel One board. This document provides the information you need to get the board installed and set up in your Angel One; for the latest information and software updates for the board please check <http://www.rabidpb.com> regularly.

This board is designed for users that prefer a microswitch trigger feel, and to those who need the best **100% tournament legal** ramping modes. The board also has other features, such as direct plugin compatibility with RF transmitters for loader synchronisation and settings adjustable via a PC connected to the USB port, for ease of setup.

### GUIDED TOUR

The Rabid Angel One board has the same connectors as the stock board; the solenoid connects to the small beige socket at the top edge of the board, the eye ribbons attach to the pair of black sockets below and to the left of this. The battery connects via spring terminals as on the stock board.

But several elements of the board are different: instead of the thumbwheel the board provides two pushbuttons similar to other markers; the upper button is the power button and the lower button controls the eyes. The board is supplied with a replacement button plate to suit the buttons; you will install this plate in place of the small silver item surrounding the thumbwheel. (Early release boards will ship with a temporary backplate and button caps; the final Aluminium parts will be dispatched free of charge as soon as they are available.)

Instead of the optical trigger sensor used on the stock board, the Rabid board uses a microswitch. The switch is positioned to work as far as possible with your existing trigger setup, whether you are using the stock trigger or an aftermarket trigger (such as the excellent Raguba range of

triggers.)

To the left of the battery area are the USB connector, for software updates and easy configuration of settings, and the Accessory Port. This port is designed to accept directly RF transmitters for loader synchronisation. Just plug the transmitter module into the upper row of holes in the 6-pin port, with the body of the transmitter laying over the small chip below it. When you have verified that the transmitter is working correctly, we recommend affixing it to the board with a self-adhesive foam pad or similar.

### INSTALLING THE BOARD AND BACK PLATE

- 1) Note the current settings on the stock board, in particular the Dwell, so it can be set to the same value on the new board.
- 2) Remove the right-side grip panel (the one without the window.)
- 3) Remove the battery, and unplug the solenoid connector and two eye ribbons.
- 4) Loosen the two screws holding the grip frame to the body, allowing the trigger to swing forward to clear the board.
- 5) Using a #1 Philips Head screwdriver, CAREFULLY remove the three screws holding the board in. The heads of these screws are easily damaged, especially if the wrong sized screwdriver is used.
- 6) Remove the old board, and the plastic shields either side of the board.
- 7) Using any small hex key, push out the stock back plate by pressing on the prongs holding it in place.
- 8) Put the New Back Plate on with the slotted side out and fit it into the frame, line up the Screw hole with the existing hole on the frame securing it with the small hex screw (1.5mm hex key, the smallest in the standard A1 toolkit.). Do not over tighten!
- 9) Place the Black Buttons in the holes in the NEW Back Plate rounded side in first.
- 10) Lay the new board in place, making sure the LED lens hasn't come out of its hole in the back of the frame. Don't screw it in just yet.
- 11) Tighten the frame-body screws, ensuring the eye ribbons are in their channel and no wires are pinched.
- 12) Now put in the three screws to hold the board. If you feel excessive resistance, back the screw out and try again, so as not to cross thread it. When the screws are in, ensure there is no movement in the board, and tighten the screws further as necessary.
- 13) Attach the solenoid connector and eye ribbons (the longer tail goes to the lower socket.)
- 14) Insert the battery, noting the BAT+ and BAT- labels on the board.

### ADJUSTING THE TRIGGER

The trigger point may need adjusting for the new board. Make certain that when the trigger is pulled, pressure is not applied to the body of the micro switch. Letting the trigger push up on the body of the micro switch will result in the micro switch being dislodged and/or broken. So, use the trigger backstop adjustment screw (the screw in the top of the frame in front of the trigger) to stop the trigger after activating the micro switch but before pushing into the micro switch body. It may seem counterintuitive, but the gun will be less prone to bounce if the magnet is backed most of the way out. If the magnet is set for a stiffer pull, there will be less "micro switch" feel but it may be more prone to bounce.

### USING THE BOARD

The top button turns the board ON and OFF. Hold it until the LED turns on and to turn the board off, hold the button until the LED goes out.

### CHECKING THE BATTERY LEVEL

Upon turning on the gun The LED will indicate the battery level. To check the battery level during play, press and release the power button.

- GREEN for good.
- YELLOW for Mid-Level.
- RED for low.

### CHECKING THE EYE STATUS

While the gun is in use, the LED will indicate the eye status.

- FLASHING BLUE: Eyes Active no ball detected
- SOLID BLUE: Eyes Active, ball detected
- FLASHING GREEN: Eyes Bypassed
- FLASHING YELLOW: Eyes Failed
- FLASHING/SOLID MAGENTA: Eyes Recovered From Failure, otherwise as blue above.

To switch the EYES ON and OFF, hold the lower button for 1 second. The LED will flicker according to eye mode while the button is held. When an eye fault (such as broken paint obscuring the eyes) is detected, the Rate Of Fire will be reduced to prevent further breakage. If the fault is cleared, the eyes will be re-enabled and the marker operation will return to normal.

## TOURNAMENT LOCK AND EYE BYPASS

The Tournament Lock Switch is located above and to the right of the Accessory Port. As shipped, the switch is covered with a protective tape which you will need to remove in order to toggle the switch. The Tournament Lock is ON in the down position, when the switch tang is aligned with the white marks on either side of it.

With the Tournament Lock ON (In the down position) if the trigger is held in while turning on the gun the eyes will be bypassed; otherwise the eyes are always active when turning on the gun.

With the Tournament Lock OFF (In the up position) and the trigger is held in while turning on the gun the marker will be started in PROGRAMMING MODE.

It is recommended that the Tournament Lock is left ON except when changing settings (or if non-tournament legal options such as Breakout Mode are desired.)

## PROGRAMMING

To cycle through the options, tap the trigger. When the desired Color Setting is shown, press and hold the trigger. On release, the LED will flash the current setting and then wait for a new setting. For Dwell and Maximum ROF, the units will be flashed first, followed by a white flash and then the tenths will be flashed.

After the current value has been displayed, if nothing is entered within 2.5 seconds, the LED will flash red/green then return to the menu without making any change. This will also happen if an invalid value is entered.

To enter a new setting, after the current value has been displayed, tap the trigger the required number of times. For Dwell and Maximum ROF, enter the units, wait for the LED to flash white and then enter the tenths. If the new value is accepted, the LED will flicker blue/cyan/green, and return to the menu.

When done, turn the board off with the power button, and return the Tournament Lock Switch to the lower (locked) position.

## PROGRAMMING SUMMARY

Here is a quick summary of the options available in programming mode.

**Cyan:** Fire Mode

**Red:** Maximum ROF

**Blue:** Dwell

**Yellow:** Debounce

**Magenta:** BIP delay

**Green:** Clearing shot

**White:** ROF Cap

**Flickering Cyan:** Ramp Start

**Flickering Red:** Ramp Semi

**Flickering Blue:** Ramp shots

**Flickering Yellow:** Breakout Mode

**Flickering Magenta:** Empty Delay

## DESCRIPTION OF SETTINGS

**Cyan: Fire Mode**

- 1: Semi
- 2: Millennium
- 3: PSP Ramp
- 4: PSP Burst
- 5: NXL
- 6: Auto Response
- 7: Custom Ramp
- 8: Full Auto
- 9: Dry Fire (Semi but no eyes, and no ROF cap. Do not shoot paint in this mode!)

**Red: Maximum ROF**

- Set in 0.1 bps increments between 2.0 bps and 25.0 bps.
- When the eyes are active, this only applies if the ROF Cap option is on (see below.)

**Blue: Dwell**

- Set in 0.1 ms increments between 1.0 ms and 20.0 ms.

**Yellow: Debounce**

- Set in 1 ms increments between 1 ms and 50 ms.
- If bounce is a problem even with a high Debounce value (above 15-20ms), try reducing the magnet force on the trigger to get more of a micro switch feel.

**Magenta: BIP delay**

- Set in 1 ms increments between 1 ms and 20 ms.
- This sets how long the eyes must detect a ball before allowing the gun to fire. This helps prevent chops when balls bounce on loading from the feedneck. For a fast loader, 3-5ms is a good start value.

**Green: Clearing shot**

- 1 is off, 2 is on.
- With this option on, holding the trigger for 1 second will force the gun to fire when a ball is not detected. This is useful for loaders activated by the firing cycle, when paint is first loaded.

**White: ROF Cap**

- 1 is off, 2 is on.
- When on, the marker will never fire faster than the set Maximum ROF. This option is only effective when the eyes are active, since with the eyes bypassed the ROF is always capped. In Dry Fire Mode the ROF cap is always ignored.

**Flickering Cyan: Ramp Start**

- This is set in 1 bps, between 1 bps and 15 bps.
- This is used in a Custom Ramp Mode, or when Breakout is set to Ramp. To set the ROF that must be reached to start ramping.

**Flickering Red: Ramp Semi**

- This can be set between 1 and 9.
- This sets how many shots must be fired at the required ROF before ramping starts in a Custom Ramp Mode. For example, PSP rules would require this to be set to 3, so that ramping starts on the 4th shot.

**Flickering Blue: Ramp Shots Per Pull**

- This can be set between 1 and 6.
- This sets how many shots will be fired per trigger pull when ramping is active in a Custom Ramp mode.

**Flickering Yellow: Breakout Mode**

- 1 is off, 2 is Ramp, and 3 is Auto.
- When this mode is enabled, the first trigger sequence after the board is switched on will fire according to Custom Ramp settings, or in Auto, after which the mode will revert to the mode set in the Fire Mode option.
- NOTE: Breakout mode will not operate if the Tournament lock is active.

**Flickering Magenta: Empty Delay**

- The Empty Delay may be increased if the firing cycle does not appear to operate correctly at extremely high rates of fire. This setting should not generally need changing, and may be removed from future software releases.