Wicked Air Sportz

Equalizer™ Installation and Usage Manual

Equalizer™ is a trademark of Wicked Air Sportz

Introduction

Thank you for purchasing the Equalizer™ board. This board is a direct replacement for the stock circuit board found in Intimidator. This board will work in ALL models of the Intimidator, with or without the LCD display. This board will NOT work in any other marker.

Please read through this **entire** manual **before** you attempt the installation of your Equalizer™ board!

Installation Requirements

To install your Equalizer™ board, you will need the appropriate sized allen wrenches and a flat, clean, work surface.

The installation of the Equalizer™ board is not difficult. If after reading through this manual, you believe you can not perform the installation, please seek someone who can assist you.

This manual should provide ample information and clarity to install this product.

Warranty Information

The Equalizer™ board carries a limited lifetime warranty. Units subject to improper installation, misuse, abuse, or modifications will not be covered under this warranty.

Wicked Air Sportz may at its discretion either repair or replace the unit. The customer will pay all freight charges to and from Wicked Air Sportz.

All defective units will be returned to the customer via USPS Priority Mail. At the time of printing this manual, this rate is $4.40. This amount must be included with any unit to be repaired, or the unit will be returned UPS COD/Freight collect.

Liability

By using this product, you agree to hold Wicked Air Sportz free from any type of liability either directly or indirectly due to the use of this product.

SECTION 1 – INSTALLATION

Step 1 – Removing the Grip Panel

Before disassembling the marker, make sure the marker power switch is in the off position.

Follow the instructions for your type of marker:

"Classic"

Remove the **left** grip panel by removing the 4 screws holding it in place. Refer to figure 1 for screw locations.

"Ground Zero (GZ)"

For the GZ, you will need to remove the **left** side plate by removing the two screws holding it in place. Next, you will need to remove the 5 screws holding the metal side panel in place. Refer to figure 2 for screw locations.

"Clamshell"

For markers with the clamshell grip (originally found on the Dragon series), you will need to remove the rubber grips (which are wrapped around the grip frame) by removing the two screws on each side. Once the grip is removed, the entire left side of the grip frame will come apart. Remove the 4 screws that hold the grip frame halves together. Refer to figure 3 for screw locations.

Other grips

At the time this manual was produced, no other grip frames are available for the Intimidator. If you have an after market grip, please consult the manufacturer about how to access the electronics.

The pictures below show the location of the grip frame or panel screws with red arrows, and location of the outer grip screws with blue arrows.

Figure 1 – Screw Locations for "Classic" model

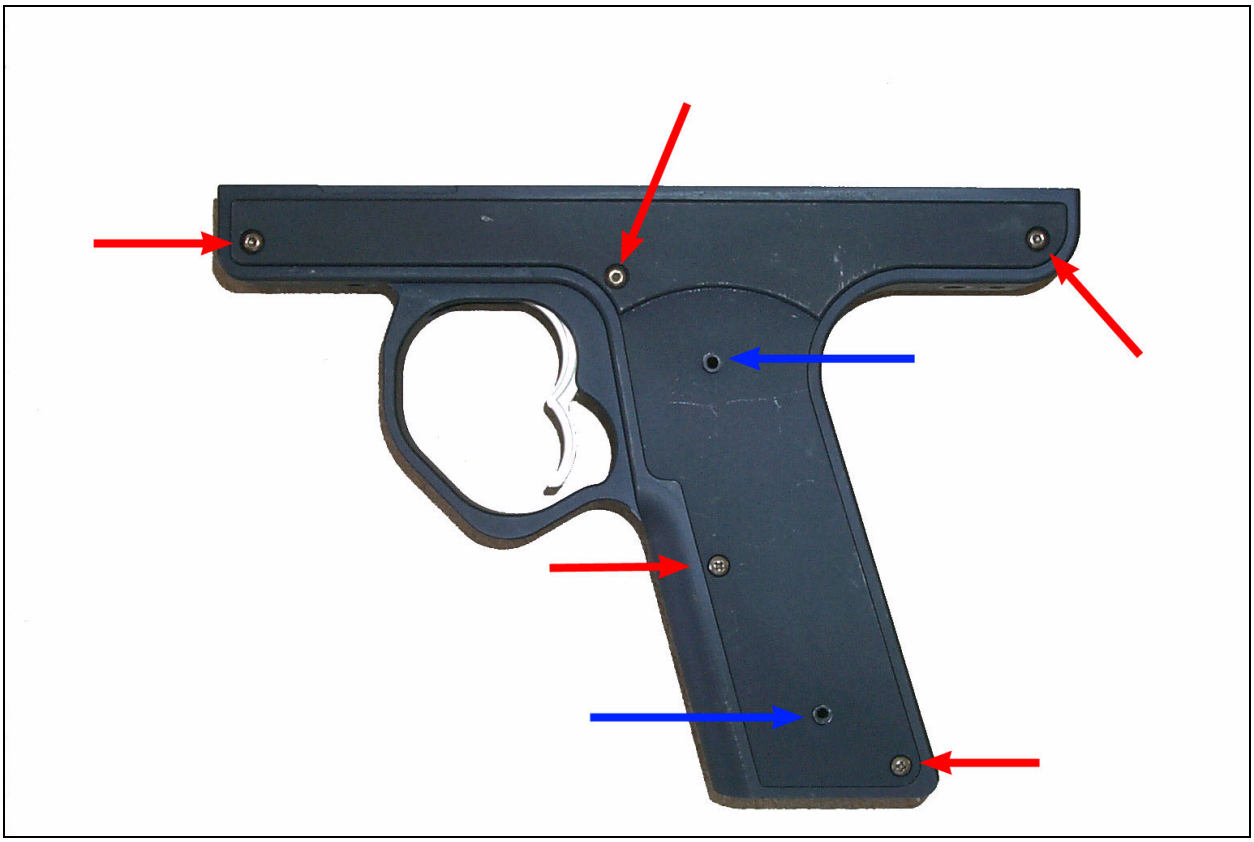


Figure 2 - Screw Locations for "GZ" model

Figure 3 – Screw Locations for the "Clamshell" model

Now that you have removed the screws for your type of marker, we are ready to separate and remove the grip panel or grip frame half itself from the marker.

NOTE: EXTREME CARE MUST BE TAKEN WITH THE WIRING HARNESS CONNECTED TO THE MEMBRANE SWITCH!

While holding the both halves of the membrane switch connector, gently pull the halves apart, effectively unplugging the switch from the wiring harness. Set the grip panel (with switch) aside.

Step 2 – Removing the Circuit Board From the Grip Frame

Using the proper size allen wrench, carefully remove the screw that holds the circuit board in place. You will find a small rubber o-ring between the head of the screw and the circuit board. It is essential that you do not lose this o-ring as it protects the circuit board from damage due to over tightening!

Once the screw is removed, gently pull up on the circuit board assembly to give yourself enough room to grab a hold of it.

Step 3 – Disconnecting the LCD Ribbon Cable

If your marker does not have a LCD display, you can skip this section.

Locate the LCD connector. Gently pull up on the white locking tabs, located on each side of the LCD connector. Refer to figures 4 and 5 for a before and after view.

Once you have pulled up on the tabs, the LCD flat ribbon cable is free to be removed from the connector. Gently pull the cable straight away from the LCD connector. Refer to Figure 6 for a detailed view.

Move the flat ribbon cable aside and pull the board away from the grip frame far enough so that you can easily see the two connectors that are plugged into the bottom side of the circuit board. Refer to Figure 7 for a detailed view.

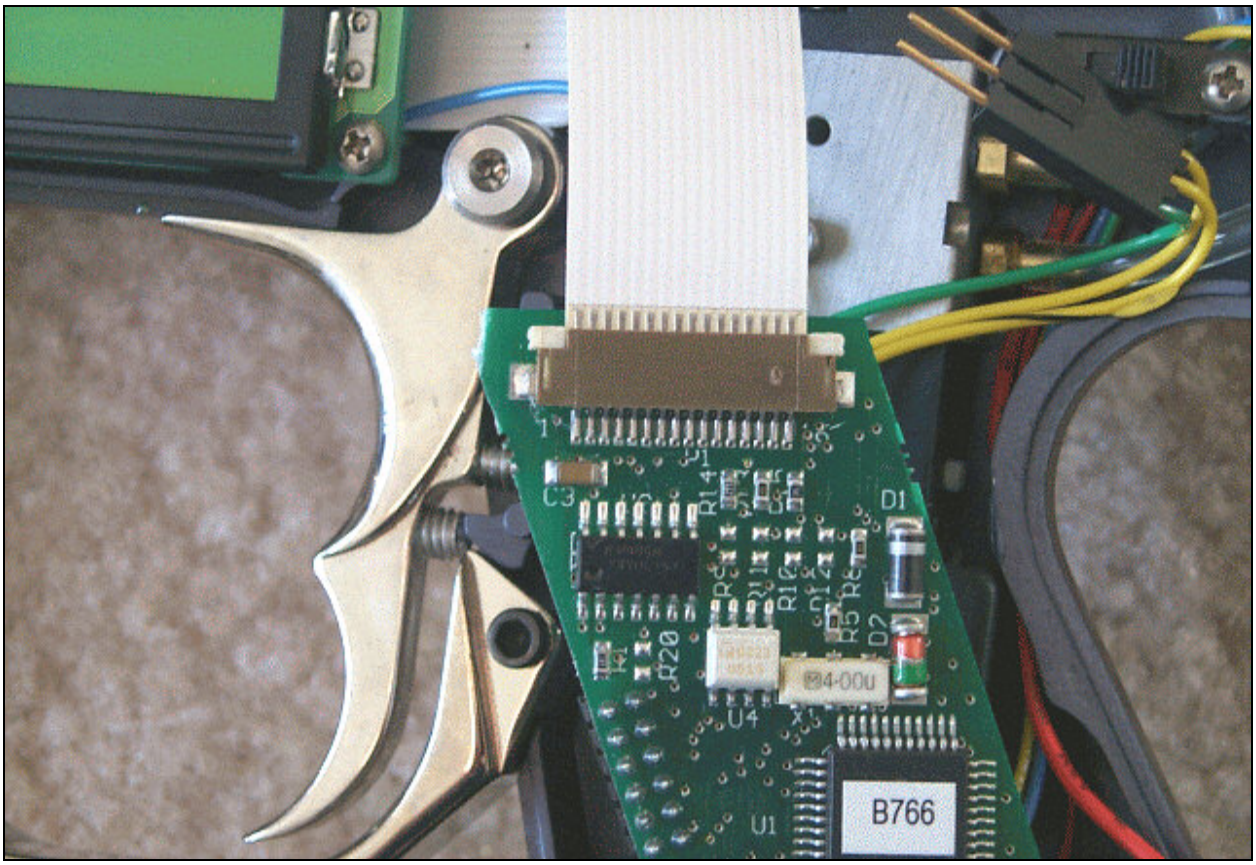


Figure 4 – LCD connector before pulling up the locking tabs

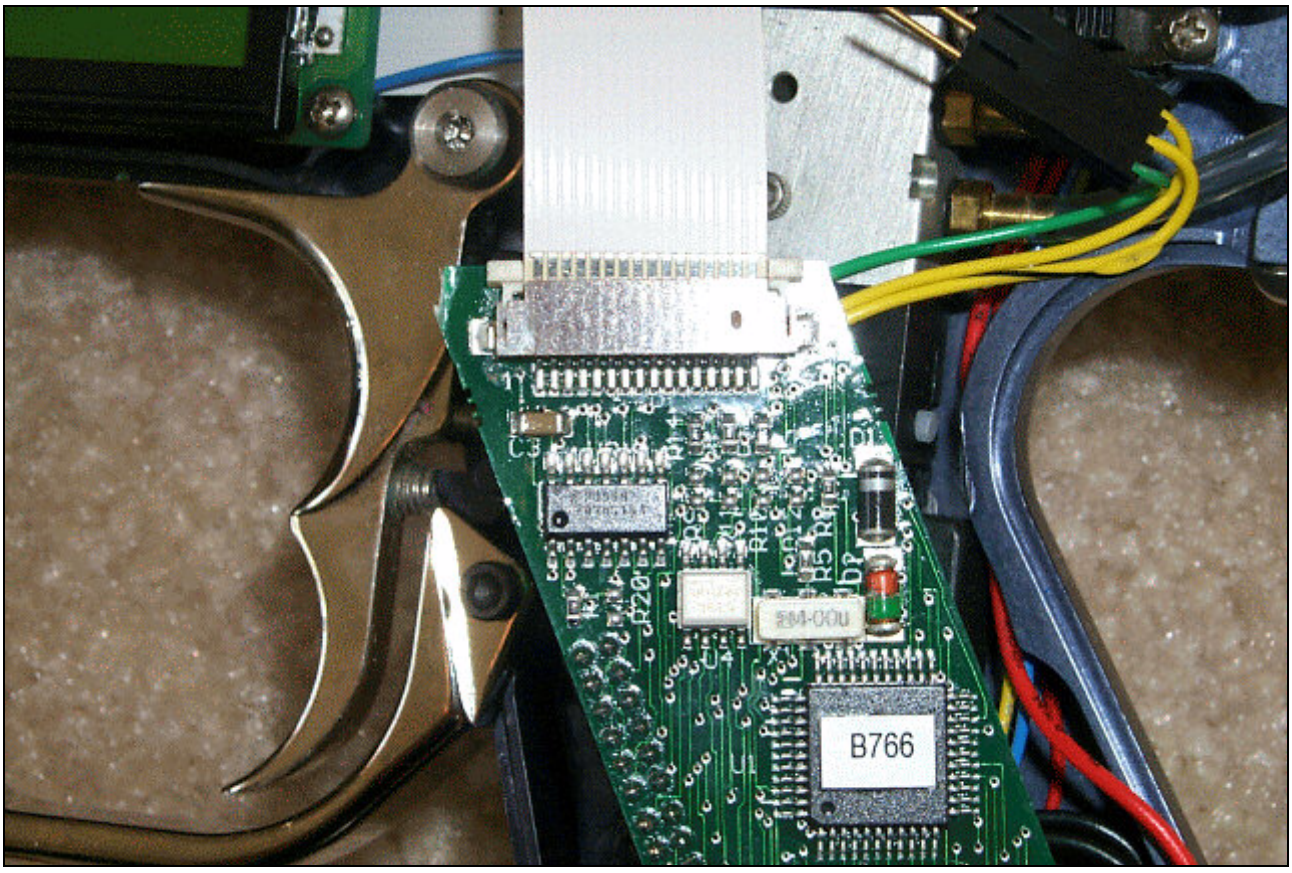


Figure 5 – LCD connector after pulling up the locking tabs

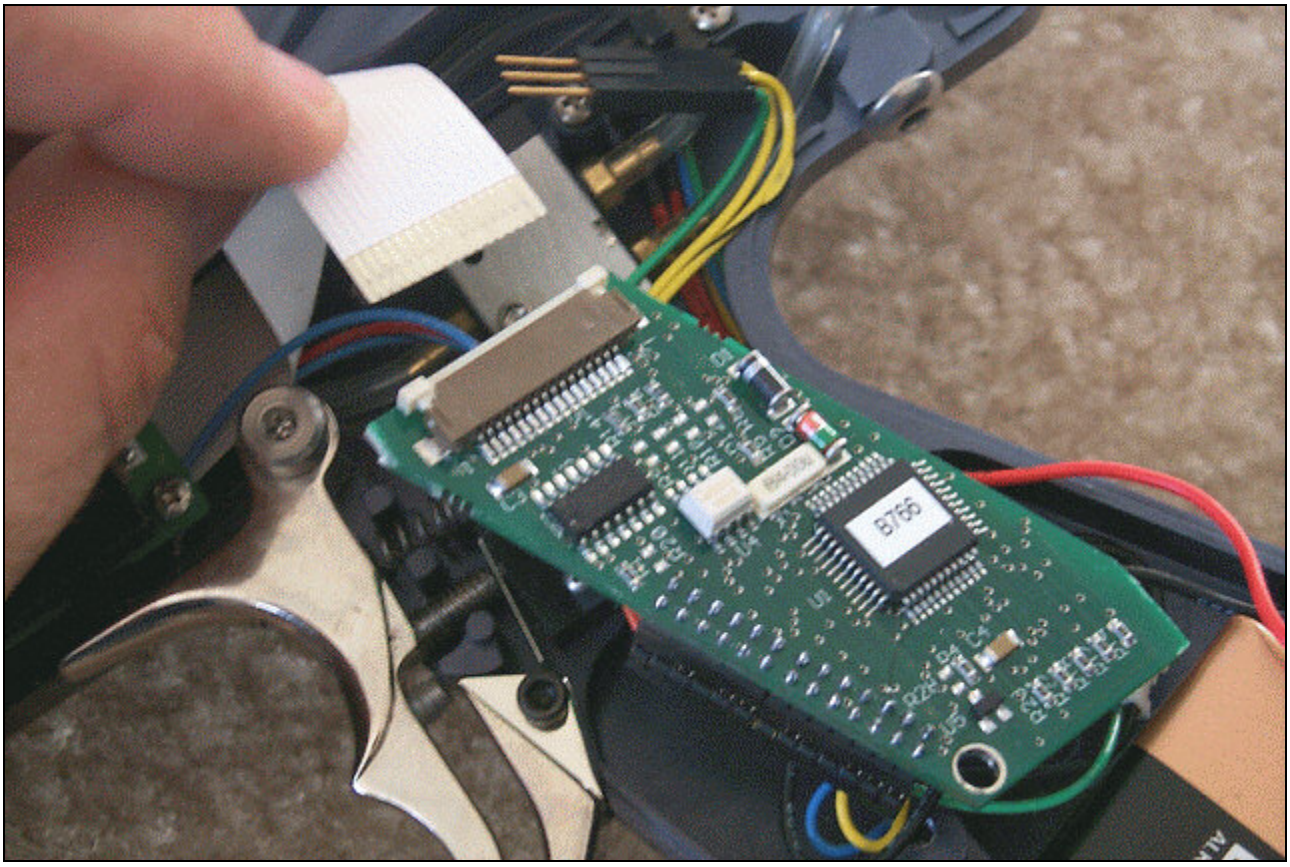


Figure 6 – Disconnecting the ribbon cable

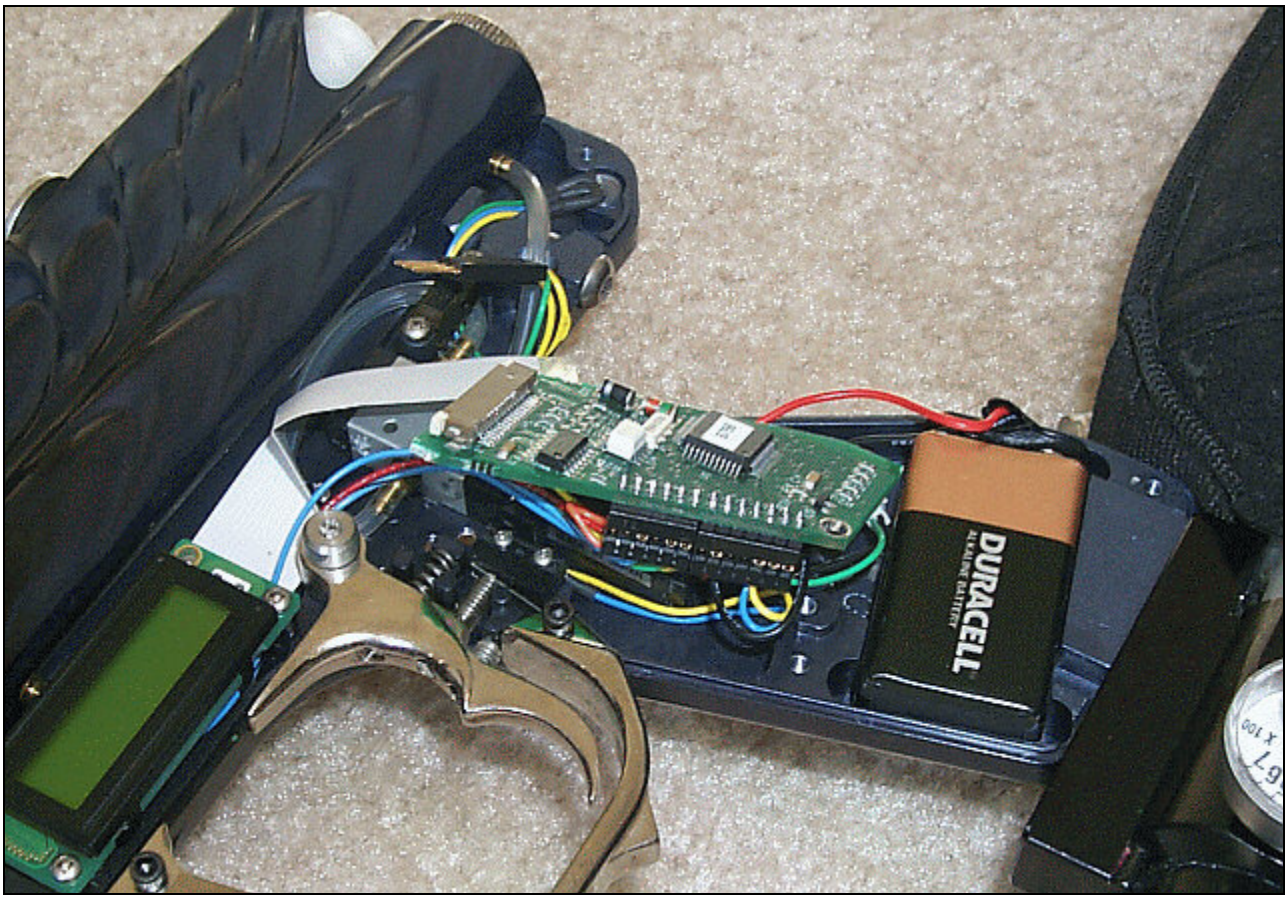


Figure 7 – View of the dual header connectors

Step 4 – Disconnecting the Header Connectors

Carefully remove the header connector closest to the LCD connector by gently pulling straight down on the header, grasping **only** the black plastic housing, and **not** the wires! You should now end up with a view that is like Figure 8.

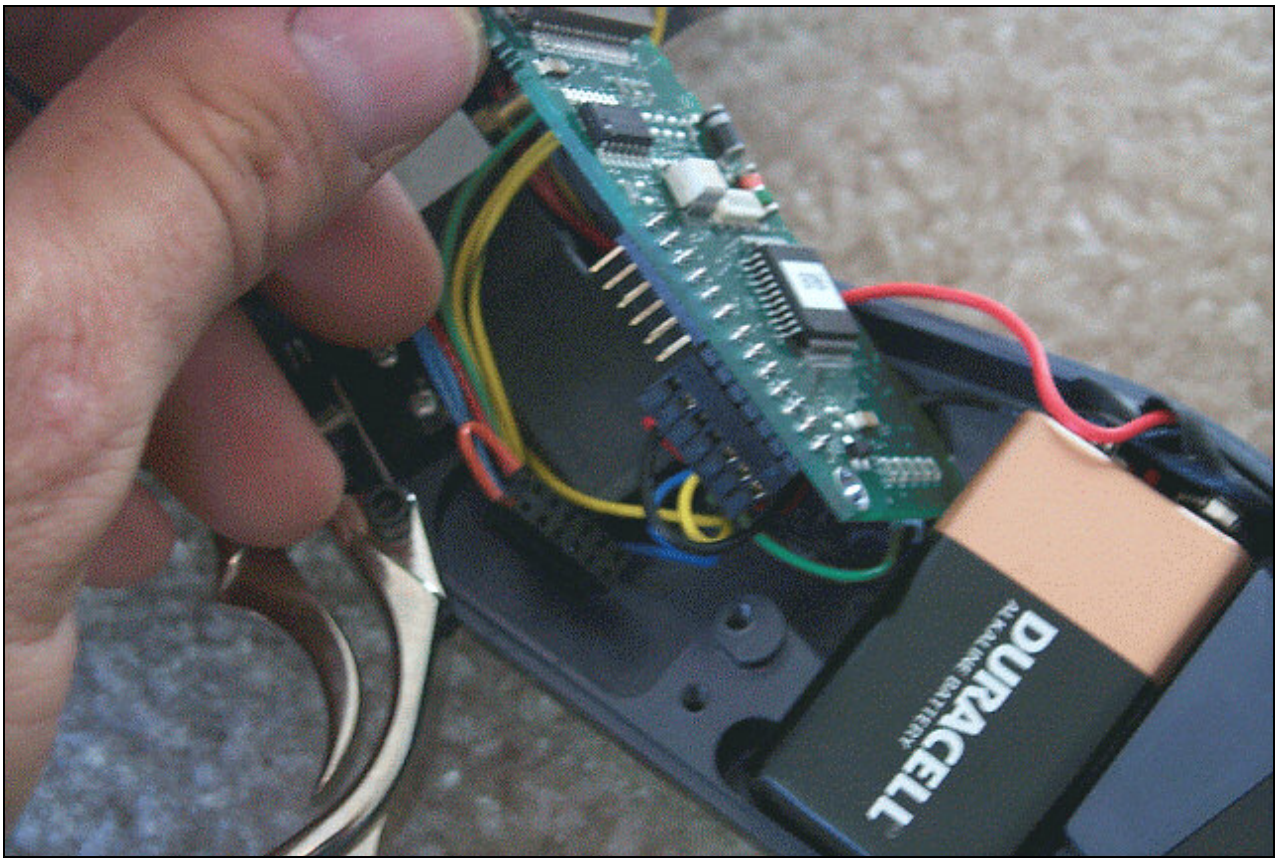


Figure 8 – One header connector removed

Remove the last connector. You can now set this circuit board aside. You will not be putting this circuit board back into the grip frame, so store it somewhere that is safe.

Step 5 – Installing the Equalizer™

Position the Equalizer™ board over the header connectors and plug both of the connectors in place. Note that the connectors are different sizes. When plugging the connectors into the Equalizer™, make sure that you are not "off" one position. Refer to figure 9 for a detailed view.

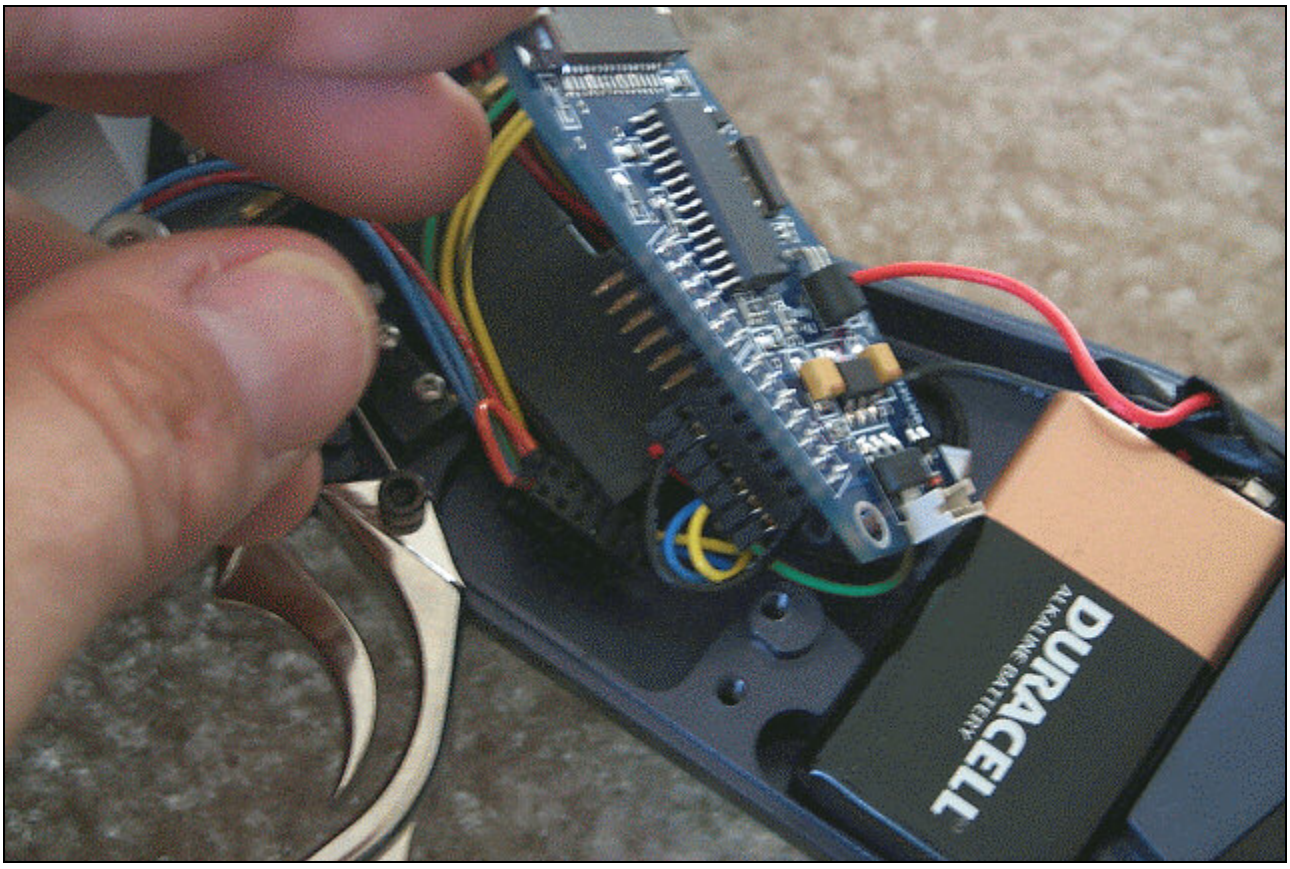


Figure 9 – One header connector connected

Step 5 – Connecting the LCD Ribbon Cable

Hold the board and pull up on the white locking tabs located on the LCD connector. Now, insert the flat ribbon cable into the connector. See Figure 10 for details. Once the cable is seated as deep as possible in the LCD connector, push down on the white locking tabs. This will secure the ribbon cable in place. Refer to Figure 11 for details.

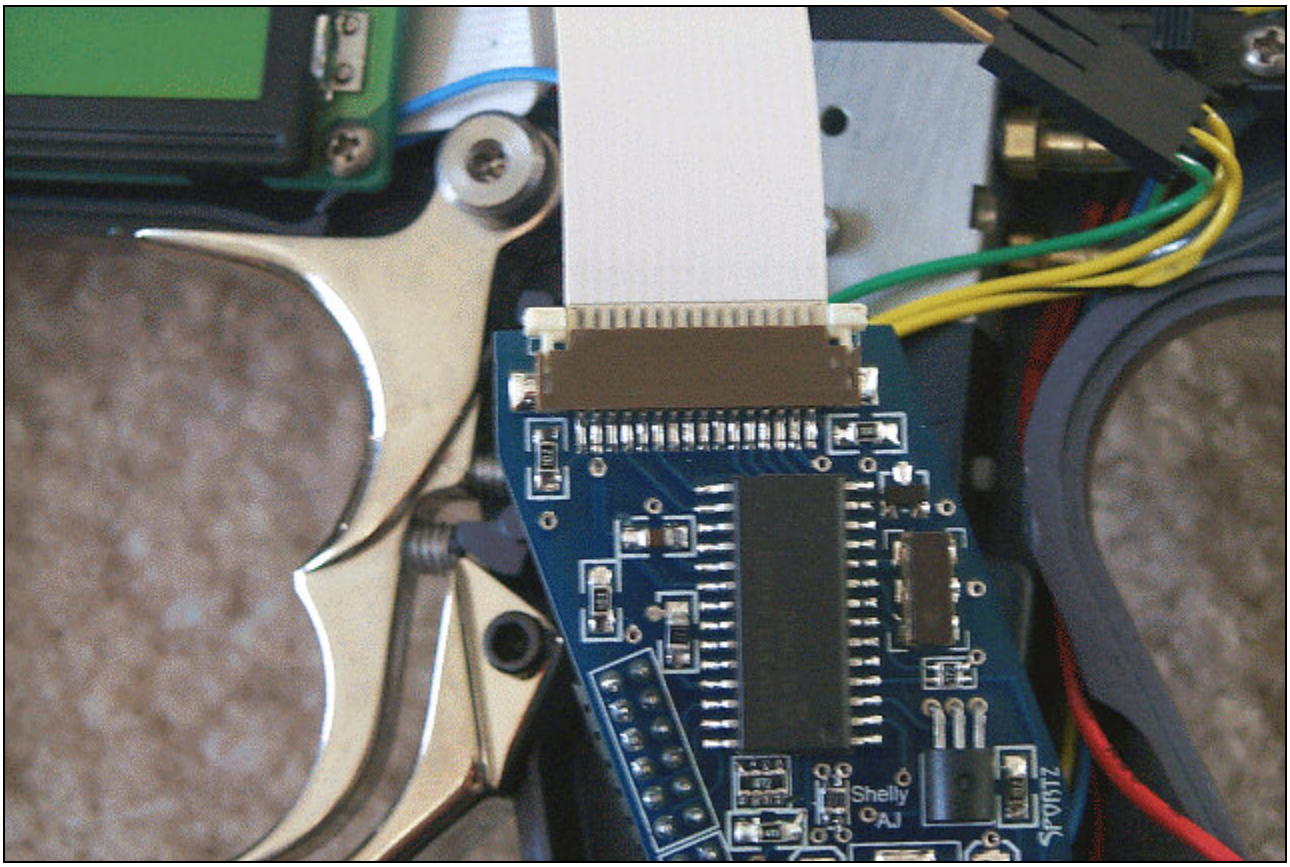


Figure 10 – Ribbon cable inserted into LCD connector, tabs unlocked

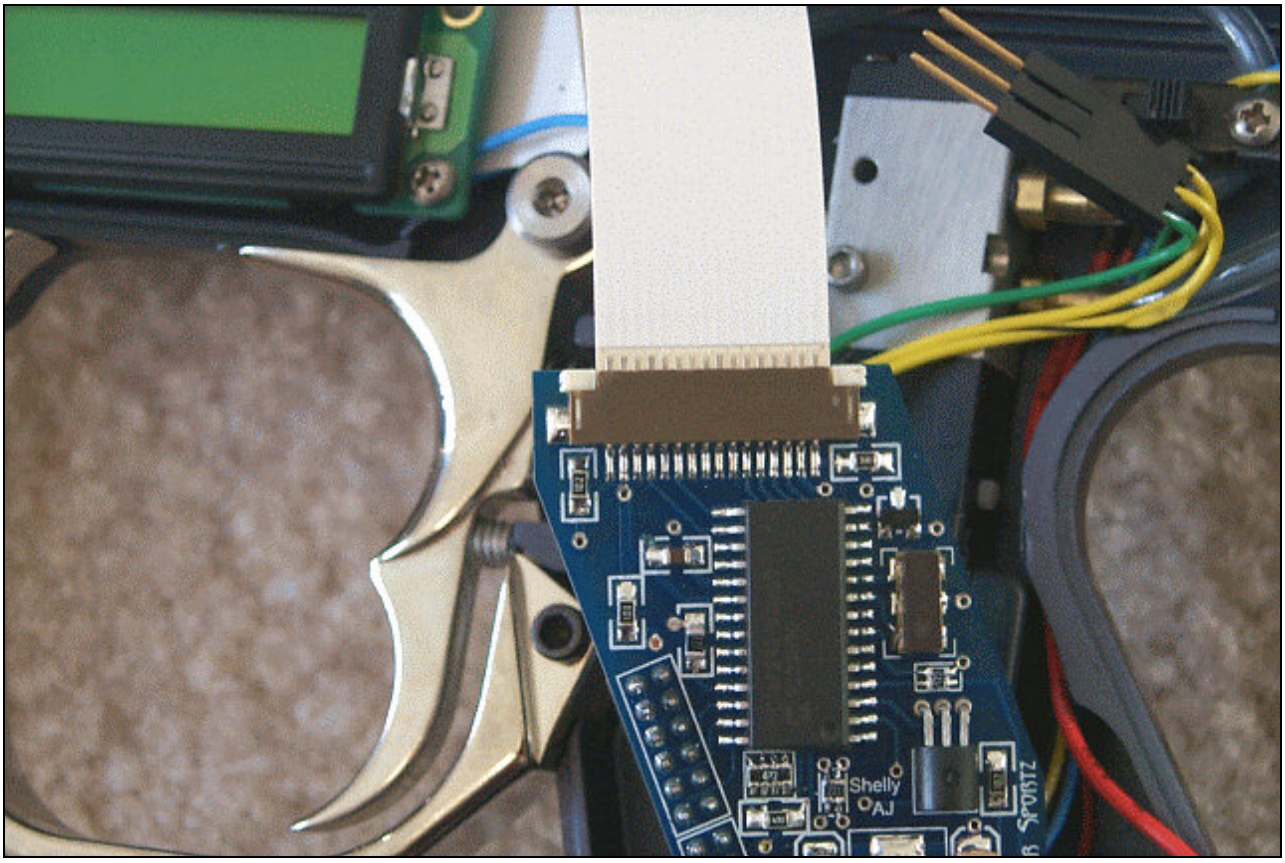


Figure 11 – Ribbon cable inserted into LCD connector, tabs locked

Step 6 – Mounting the Board Into the Grip Frame

Carefully press the Equalizer™ into the area designed for the circuit board to fit in. Make sure that you do not pinch any wires in the harness. Line up the hole (lower corner of the Equalizer™) with hole where the screw goes into. Make sure that the rubber o-ring is over the screw. Now, insert the screw into the hole and tighten the screw until the o-ring is just snug (not being deformed from too much pressure). See Figure 12 for a detailed view.

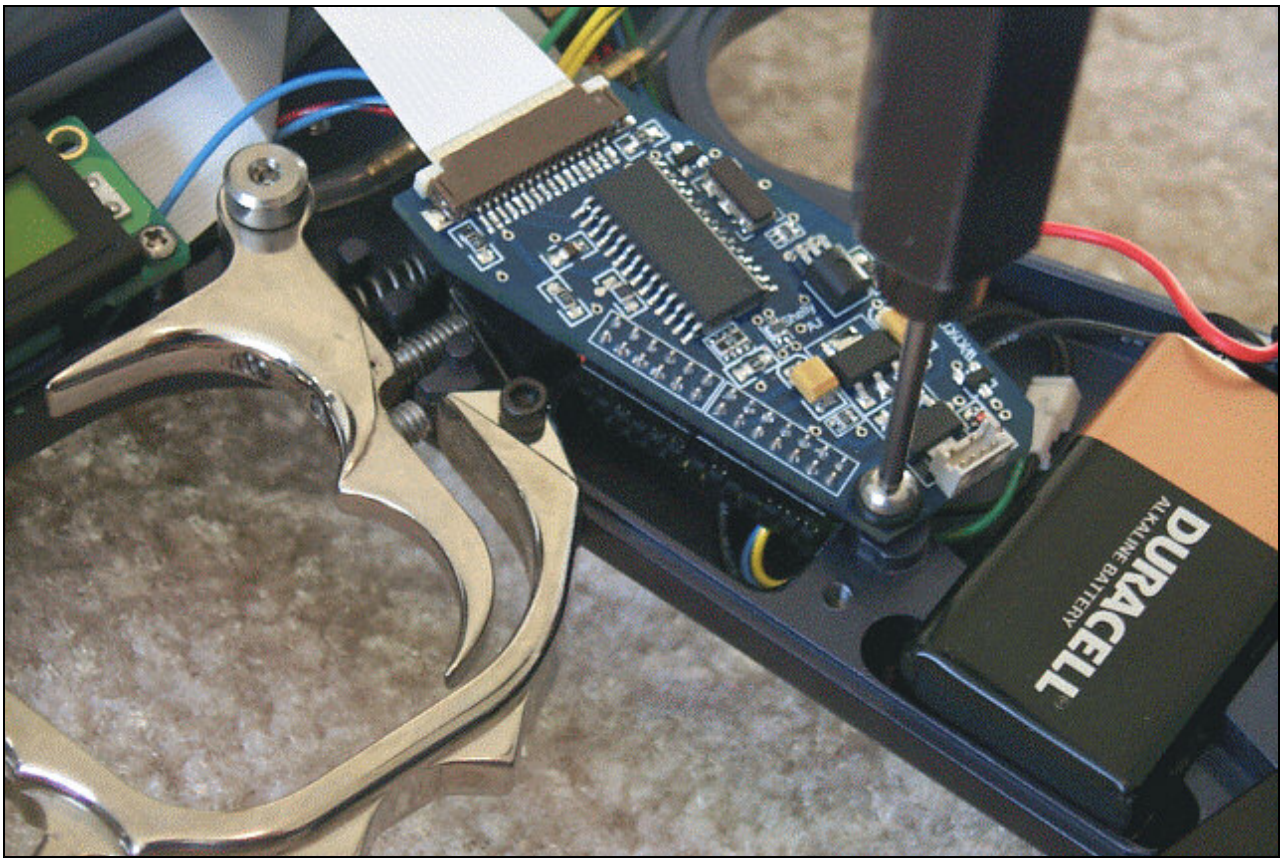


Figure 12 – Tighten the screw until the o-ring is snug

Step 7 – Connecting the Membrane Switch Harness

If your marker does not have a LCD display, you can skip this section.

Get your grip panel or grip frame half, and reconnect the switch harness by grasping both ends of the connectors and pressing them together. Please note that there is a polarity for the plugs. Although these are not marked, you can identify which direction the plug goes by looking at the connectors. The connector coming from the membrane switch will have gold contacts that are visible through the plastic. This is the correct orientation. The connector from the wiring harness also has these gold contacts, but you must install this connector with the gold contacts facing away. Please study Figure 13.

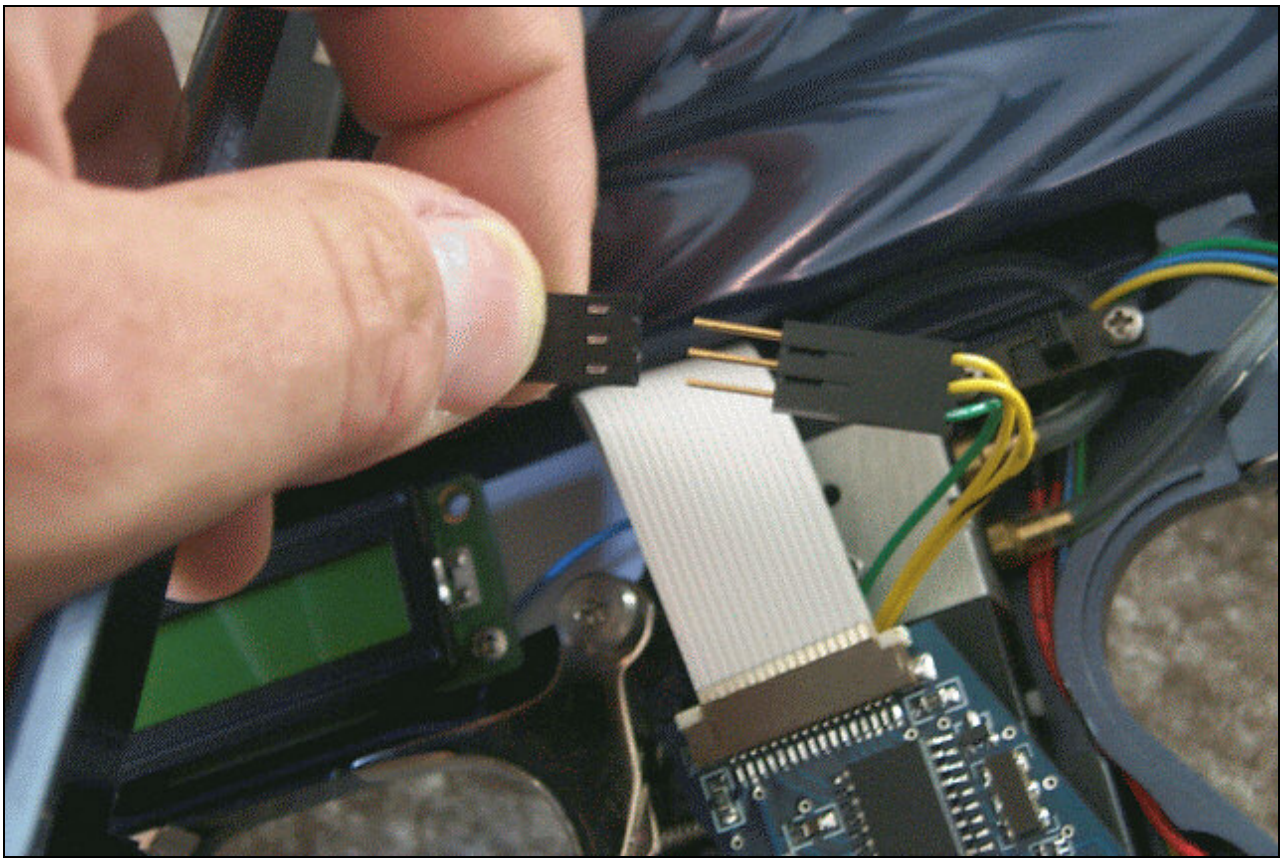


Figure 13 – Proper orientation of the membrane switch connector and wiring harness connector

Step 7 – Testing the Board

Before reassembling the marker, you should do a quick test to make sure that connections are correct and that the board is working. Making sure that nothing is grounding the grip panel or grip frame half, move the power switch to the on position. If everything is working, you should see a welcome message from the LCD display. You will also see the LED light up orange. If this occurs, turn the power switch to the off position and continue to step 8.

If you did not see anything on the LCD display (providing you have one), but the LED did light up orange, then your connection at the LCD connector is faulty. Go back to step 5 and try again. If you don't see the LED light up, make sure your battery is connected. If that is not the problem, then check the header connector plugs. If you require further assistance, please email the technical support department (tech@wickedairsportz.com).

Step 8 – Reassemble the Marker

Reassemble the grip panel or grip frame half.

Congratulations! You have now successfully completed the installation of your Equalizer™ board!

SECTION 2 – USAGE

The Equalizer™ has numerous features, which can be a bit overwhelming to those that are not use to having so much flexibility.

The Boot Sequence

When the Equalizer™ boots up, you will see the following messages, exactly one-second apart:

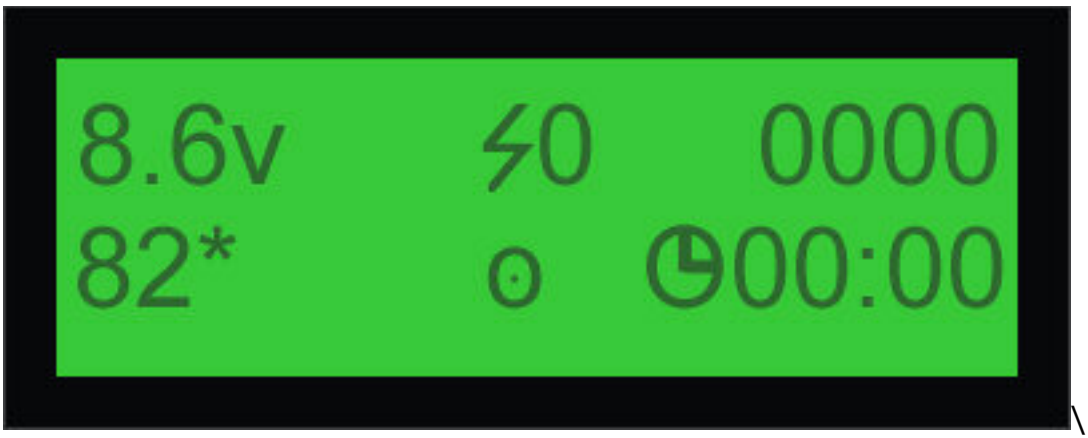
Bob Long's
Intimidator

Equalizer vX.X	(the x.x is the version and revision of the software)
NORMAL Mode	(or COMPETITION Mode if the board is locked)
Registered Owner	
NEW USER	(you can put your name here using the Equalink)
Booting…	
XXXXXXXXXX	(EEPROM is being read, and a progress bar is shown)

About the Display

There are many items displayed, and depending on what version of the software your board has, this documentation may not correctly represent the latest changes. For a list of changes, as they occur, and software updates, please visit the Wicked Air Sportz website!

Current software release covered in this manual: v1.4



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The display shows the current battery voltage in the upper left corner. The current temperature is displayed in the lower left corner. The upper right corner is the current shot count (the number of shots that have been fired). The lower right corner is the game timer. If the alarm symbol is shown, then the trigger output is set. In the center of the top line of the display is a lightning bolt, which represents the rate of fire. Next to this symbol is a number, which is the current maximum rate of fire achieved. In the center of the bottom line of the display is an 'eye ball'. When the anti-chop system is enabled (and functioning properly) the eyeball is open (it can see). If the symbol is solid (eyeball closed), then the anti-chop system is bypassed.

Getting In and Out of the Menu

To get into the menu, press and hold both buttons (located to the left and right sides of the display) until you see the following:

To get out of the menu and back to using the marker, press and hold both buttons again. There is no 'Exit' menu item!

Scrolling Through the Menu

To change menu items, press and release the left button. Each time you press the left button, the next available menu item will be shown. To select that item, press and release the right button.

Changing Parameters

The menuing system allows for you to change parameters quite easily. Pressing the left button will increment or decrement the current value, depending on the direction (indicated by an arrow at the top left of the display). Briefly pressing (or just 'tapping') the right button will toggle the direction, and the arrow will change to indicate which direction (increment or decrement) parameter changes will occur. This feature was added so if you were to miss the setting you wanted, you didn't have to go 'around the horn' and come back to it.

Saving Parameters

To save changes made to a menu item, press and hold the right button until you see a '*' directly to the left of the word 'Save'. This indicates that the save is complete and you can then release the right button. When you do release the right button, you will be taken back to the menu selection phase.

Note: each time you enter and exit the menu, the last viewed item will always be the first menu item you will see.

Menu Item Descriptions

Dwell

Dwell is the amount of time that the solenoid will be activated. This time is measured in milliseconds (1/1000th of a second). The user can alter the Dwell only when in NORMAL mode. In COMPETITION mode, the Dwell menu item is not listed. Possible values are from 4.0ms to 25.5ms. The factory default is 8.0ms. Changes are made in .1ms units.

Increasing your Dwell will increase the velocity of your marker. If you are experiencing a great variance in your chrono results, try increasing your Dwell. If your dwell is too low, consistency will suffer greatly.

Debounce

Debounce is the amount of time the trigger switch must be stable in the up position before checking for another trigger pull. This time is measured in milliseconds. The user can alter the Debounce only when in NORMAL mode. In COMPETITION mode, the Debounce menu item is not listed. Possible values are from 1ms to 255ms. The factory default is 10ms. Changes are made in 1ms units.

If you find that your marker is double firing, increase the Debounce time. To make your marker fire faster due to being more responsive to the trigger, decrease the Debounce time.

Eye Mode

The Eye Mode is can be set to one of four different modes:

Bypass - The anti-chop system is disabled. When this occurs, the maximum rate of fire is limited to 12.5 balls per second to help prevent chopping of balls in the breach.

Delayed – This is like the normal method of firing used in the original Intimidator select fire and semi-only boards. If you pull the trigger and no ball is found in the breach within ¾ of a second, the marker is fired anyways. If a ball is found before the time expires, the marker will immediately fire (before the ¾ of second time is up).

Forced – In this mode, the marker will not fire unless there is a ball in the breach. In this mode, your Intimidator will not "dry fire" ever.

Simulate – In this mode, a ball is simulated to be in the breech. This allows you to fire the marker with just air, at the full speed that the marker is capable of firing! This mode can be used for practicing trigger pull methods, without wasting paint. **DO NOT SHOOT PAINT IN THIS MODE!**

It is highly recommended that tournament players use the Forced mode. If you have a hopper jam or something hangs up in the feed tube, and you are using Delayed mode, it is possible to chop a ball if one breaks free at the instant the firing sequence starts. Although this is not common, this does happen enough to justify the creation of this mode. The factory default is Delayed.

BIP Delay

BIP (or Ball In Place) Delay is the amount of time to wait when a ball is detected in the breach. The infrared 'eyes' detect the ball before it actually touches the bottom of the breach. Balls can bounce when hitting the bottom of the breach. This time is used as a 'settling time' for the ball to become fully in the breach and ready to be fired. Possible values are from .1ms to 25.5ms. The factory default is .1ms. Changes are made in .1ms units.

Hoppers that use force-feed can often times provide too much pressure on the stack of balls. Research shows that in these cases, a BIP Delay of .1ms (the default) eliminates most of the ball breaking. If you experience an actual chop of a ball when using a gravity feed hopper, you will need to increase this delay to approximately 2.0ms.

Ram Delay

Ram Delay is the amount of time to wait before the looking for the return of the bolt on a firing sequence. Since the pneumatics vary greatly depending on the pressure level they are being driven at (and numerous other factors), it is necessary to provide some sort of delay to insure that the bolt has moved past the location of the 'eyes' after the firing sequence begins. Possible values are from .1ms to 25.5ms. The factory default is 15.0ms. Changes are made in .1ms units.

It is unlikely that you will ever need to alter this setting unless the Intimidator cylinder and ram are changed to a unit that cycles even faster than it does now.

Bolt Delay

Bolt Delay is the amount of time to wait after the 'eyes' have seen the bolt return. Possible values are from .1ms to 25.5ms. The factory default is 2.0ms. Changes are made in .1ms units.

Due to ambient light, o-rings, and even debris, the 'eyes' can false trigger as the bolt moves backwards towards it stopping point. The Bolt Delay, in combination with how the infrared beam is driven for the 'eyes', is the key to the Equalizer's high rate of fire without skipping shots.

Timer Start

The Timer Start can be set to one of two different modes:

Trigger – The timer starts on the first trigger pull.

Button – The timer starts when briefly pressing the left button.

If you play tournaments where there is a 10 or 20 second countdown, it is recommended that you set this parameter to Button. Shooting your marker to start the clock when the countdown begins can get you eliminated. The factory default is Trigger.

Game Timer

The Game Timer is used to keep track of the time remaining in a game. What starts the game clock (as well as the event timers) is determined by the Timer Start setting. Possible values are from 10 seconds to 99 minutes and 50 seconds. The factory default is 10 minutes. Changes are made in 10 second units.

Setting the game timer to be 10:20 would give you a 20 second countdown. Set the Timer Start to be 'Button', and press the left button to start the timers.

Event 1 & 2 Timers

The Event Timers are just like the Game Timer, except they keep track of different times for whatever purpose the player would like. Normally, these are used for the alerting the user of the ½ way point in a game, and also at the 1 minute mark. Possible values are from 10 seconds to 99 minutes and 50 seconds. The factory default for Event 1 Timer is 5 minutes, an default for Event 2 Timer is 1 minute. Changes are made in 10 second units.

Future Intimidators will use this feature in conjunction with a vibrator motor to vibrate the grip. Experienced users can use this feature. Please contact our technical support department via email (tech@wickedairsportz.com) if you have questions concerning the alert output.

Shot Warning

The Shot Warning is the number of shots fired before the alert output is triggered. This is a handy feature for players that compete in tournaments where limited rounds are available. This feature can also be used by players as a loader alert, notifying you that you should reload your hopper after shooting so many balls. The factory default is 150 shots.

The alert will re-trigger every time same number is reached. For example, if the Shot Warning was set to 175 shots, you would get warnings when 175 shots was reached, when 350 shots was reached, when 525 shots was reached, and so on.

Hopper Trigger

The Equalizer™ hardware has the ability to generate a positive or negative going pulse, for a duration that is user programmable. Although the Equalizer™ can not supply power to your hopper to run it (in place of its own batteries), it can provide a trigger that could force an activation for a programmable period of time. More information about the interface to the Equalizer™ will be provided in separate documentation. Possible values are .1 to 2.0 seconds, with either a positive or negative going pulse. The factory default is positive pulse, lasting 1.0 seconds. This configuration was designed to work directly with the Warpfeed from Air Gun Designs.

Reset

This option will reset ALL of the settings to the factory default! If you find that you are having problems remembering the factory defaults, just use this option to reset your board and start over! The user can Reset the board only when in NORMAL mode. In COMPETITION mode, the Reset menu item is not listed.

LED Colors and Meanings

The LED is a type that can light up in one of 3 different colors. The Equalizer™ uses this to indicate to the user when certain events are occurring. This is a breakdown of what the LED states represent:

Solid Red	- In menu mode.
Blinking Green	- Normal operation, anti-chop system is enabled.
Blinking Orange	- Normal operation, anti-chop system is disabled.
Blinking Red	- Battery is low.
Red/Green toggle	- There is an error with the anti-chop system.

General Usage Tips

The LED boot sequence is as follows: solid orange (booting), solid green (normal mode) or solid red (competition mode). Pressing the left button will stop the game and event timers. Pressing and holding the left button will reset the shot counter, game and event timers, and the maximum rate of fire.

The maximum rate of fire is calculated by taking at least 1 full second of shooting and counting how many shots were fired during that time. The maximum rate of fire is store on the display until it is reset. The highest ever maximum rate of fire is store in the EEPROM, and can be retrieved via the Equalink interface.

You can manually bypass the anti-chop system by moving the bolt forward (blocking the infrared beam) and pulling the trigger 3 times. When the anti-chop system is bypassed, the LCD display will indicate this, and the LED will blink orange (instead of green).

The first two times you pull the trigger, the LED will toggle red/green to let you know that an error occurred with the anti-chop system. If a shell fragment entered the breach, it could be cleared on the next shot.

Thus, disabling the anti-chop system immediately on the first problem is something that the Equalizer™ does not do.

The rate of fire is limited only by how fast the pneumatics will cycle, how fast you can pull the trigger, and how fast your loader can feed your marker.

Because the Equalizer™ can easily exceed the feed rate of standard agitated hoppers, it is recommended that you use an advanced hopper (TurboRev equipped Revolution) or a force-feed type of hopper for the best possible performance.

After entering the menu mode, and you do not press a button for 30 seconds, the LCD display will show 'SAFE MODE' and the Equalizer™ will be in a power saving mode. Pressing any button will return you back to the menu.

While in the menu mode, the marker's ability to shoot is completely disabled.

Tournament Lock

It is possible to put the Equalizer™ into a tournament lock (COMPETITION) mode. You can do this by making sure the power switch is in the off position, grounding (connecting) the two center pins on the Equalink interface connector, and then moving the power switch to on position. Each time you 'reboot' with the pins grounded, the NORMAL and COMPETITION modes will toggle. The marker will not fire with the jumper in place! Removing the jumper will allow the normal operation of the marker.

Programming the Dwell and Debounce Without an LCD Display

If your marker does not have the LCD display, you can still program the Equalizer™. The Dwell and Debounce functions are programmable by following these instructions:

Make sure the power switch is on the off position. During programming, make sure that your marker has a barrel condom in place or the air supply shut off. Although it is not possible to fire the marker while in programming mode (or menu mode), it is always good to practice safe marker handling.
Pull the trigger, and hold it in the back position. Now, turn the power switch to the on position. The LED will light orange. Now, release the trigger. The LED will light red.

Pulling and releasing the trigger will toggle the LED color between red, green, and orange. Red indicates you are in the Dwell programming mode, green indicates you are in the Debounce programming mode, and orange indicates you are in the Eye Mode programming mode. This is also known as the "programming starting point".

When you decide which programming mode you want, pull the trigger and hold it until the LED goes out and then release the trigger. There will be a 2 second pause, and then the LED will flash the same color of the programming mode you are in (red=Dwell, green=Debounce, orange=eye mode).

For the Dwell and Debounce programming modes, each flash represents 1ms (millisecond) of time. For example, if you were programming the Dwell and the settings were the default, you would see the LED flash red 8 times in a row, indicating the dwell is set to 8ms. The flashing of the LED shows you the current setting **before** you program it.

For the Eye Mode programming mode, the total number of flashes represents the mode of the anti-chop system.

Dwell and Debounce

Once the LED stops flashing, you can now pull and release the trigger once for every 1ms of time you want the setting to be. For example, if you were programming the Debounce for 5ms, you would pull and release the trigger 5 times. On each pull of the trigger, the LED will light up (indicating that the pull has been detected). If you have decided not to program this mode, simply do not touch the trigger for 5 seconds. The LED will toggle green/red alternately to indicate there was a programming error, and then go back to the programming starting point.

Eye Mode

Once the LED stops flashing, you can now pull and release the trigger the number of times necessary to set the Eye Mode.

Here is a break down of the possible Eye Modes and the flashes (also trigger pulls required):

1 flash – Bypassed mode
2 flashes - Delayed mode
3 flashes – Forced mode
4 flashes - Simulate mode

If you pull and release the trigger more than 4 times, then the LED will toggle green/red alternately to indicate there was a programming error, and then go back to the programming starting point.

Programming Complete

Once you pulled and released the trigger the number of times necessary to set the function, wait a few seconds. The LED will flash red/green/orange in rapid succession (numerous times) to let you know that the new setting has been saved. After this, the LED will return to the color representing what the current programming mode is. At this point, you can once again press and release the trigger to toggle between Dwell, Debounce, and Eye Mode programming modes.

You can perform a complete reset of the Dwell, Debounce, and Eye Mode to the factory defaults when you are in the program starting point (where you can toggle the programming mode). To do this, just hold down the trigger for 5 full seconds. It does not matter what programming mode you currently in (Dwell, Debounce, or Eye Mode). The LED will start flashing red, letting you know that a reset operation is being performed. After this occurs, you will be back to the programming starting point.