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The Clone paintball marker is covered by the following granted patents as well as international pending patents:
U.S. Patent Nos. 5,228,427; 5,755,213; 5,957,119; 6,260,821; 6,349,711; 6,494,195; 6,644,295; 6,644,296; 6,823,857;
6,694,963; 6,810,871; 7,017,497; 7,044,119.

CLONE[®] 5
Owners Manual



Clone 5 Model Owners Manual

V1.00

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MacDev Warranty

MacDev offers a 12 month limited warranty period on your MacDev manufactured electro-pneumatic marker. The MacDev electro-pneumatic marker is warranted to be free from all manufacturing and production defects for a period of 12 months from the date of manufacture, unless a proof of purchase is provided (within 30 days of purchase) in which case the 12 month period will begin from the time of original purchase. Warranty cover is dependent on successful completion of warranty registration via www.macdev.net/warranty. Warranty exceptions include, but are not limited to, accidental damage, misadventure, reasonable wear and tear and consumable components such as O-rings, detents, batteries and eyes. Warranty work must be undertaken by an authorized MacDev Tech Centre or at a MacDev sanctioned Tech Support booth.



This is not a toy. Misuse may cause serious injury or death. Eye protection designed specifically for paintball must be worn by user and persons within range. Recommend 18 years or older to purchase. Persons under 18 must have adult supervision.

READ OWNER'S MANUAL BEFORE USING.

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KNOW YOUR CLONE®



Your Clone marker contains some of the most innovative new features, wrapped around a fresh Clone drive. Soft silicone grips on the barrel and front grip lend accuracy and comfort to your shot. The frame shape and spacing is unique to MacDev and is carefully designed to balance the weight of your Clone.

The drive inside your Clone is cutting edge, with high precision CNC machine parts and a soft moulded bolt tip to contact the paintball. The drive is easily accessible using the pull up drive cover.

The marker is powered by dual microprocessors handling the firing cycle at lightning speed, as well as driving a high resolution OLED display.

Please take the time to learn the parts of your Clone, it will help you when reading this manual.

Numbered basic parts as shown in the figure on the left:

1. Shift 2 barrel
2. Feed clamp lever (used to affix your loader)
3. Drive cover (pull up and back to remove)
4. Velocity regulator adjustment (anti clockwise to increase velocity)
5. Eye covers and screws
6. OLED display used to view gun status/settings
7. Trigger with screw adjustments
8. Membrane pad with power and programming buttons
9. Venting ASA, screw your air system in here
10. Venting ASA on/off knob (used to turn the air on or off)
11. Front grip assembly

Please note, the features and included accessories are subject to change, and may vary from those show in this manual.

QUICK SETUP

Switching your Clone on and off

The on/off button is located on a membrane pad on the rear of the frame. Push the button with the power symbol (🔌), when done correctly, your OLED will display the MacDev logo and the marker will be set with the beam sensor system on and ready to fire. Turn your marker off by holding the power button down until the OLED system goes blank.

Firing your marker

If a paintball is loaded in your marker, and the power is switched on, you may fire the marker by pulling the trigger. If a paintball is not loaded, then you need to either load one, or read the section below on disabling the beam sensor.

Understanding the beam sensor

Your marker is equipped with a visible light sensor to determine if a paintball is correctly loaded. This system is used to prevent accidental ball breakage due to misloaded paintballs. The OLED indicator on the side of your grip will show you the status of the beam sensor:



Ball loaded



Sensor disabled



No ball loaded



Sensor fault

Disabling the beam sensor

To disable the sensor (for dry firing), hold the scroll button on the membrane pad (📄) until the beam sensor disabled icon appears on the OLED display. You can re-enable the beam sensor the same way.

Membrane Pad



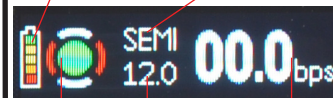
🔌 Power button
(for power on/off)

📄 Scroll button
(for eyes on/off and programming)

OLED Display

Battery meter

Cycle mode



Cycle speed (max)

Sensor status

ROF meter

Installing a preset air system

Your marker comes equipped with a high quality venting ASA (Air System Adaptor) that is designed for use with commercially available air/nitrogen systems.

The venting ASA included with your marker uses a knob to turn the air from your preset system on or off. Before installing your preset air system, you must unscrew the ASA knob by approximately 3 turns.

Once this is done, carefully screw your air system into the ASA until it stops.

WHEN SCREWING YOUR AIR SYSTEM INTO THE ASA, THE THREADS SHOULD BE LOOSE. IF AT ANY POINT THEY BECOME TIGHT, DO NOT FORCE THE THREADS, THIS MAY CAUSE DAMAGE TO YOUR AIR SYSTEM OR YOUR MARKER!

Turning the air on and off

To pressurise your marker, screw the ASA knob down until it stops. This will depress the pin on the end of your air system and pressurise the marker (provided you have sufficient air in your air system).

To depressurise your marker, unscrew the ASA knob until you hear the air being vented from the cap. Your air system is now turned off and safe to remove.

NOTE: WHEN YOU UNSCREW THE ASA KNOB, YOUR MARKER MAY STORE ONE SHOT. POINT THE MARKER IN A SAFE DIRECTION AND FIRE OFF THAT SHOT BEFORE ENTERING A SAFE AREA.



Installing an air system



Turning the air on

Using a loader with your Clone

Your marker can operate using any commercially available loader. The software and beam sensor will compensate for the speed of the hopper, ensuring that the marker fires as quickly as the loader allows.

Installing a loader onto your Clone

Open the cam lever as shown. This should allow your loader neck to fit into the feed tube as shown. If your loader does not fit into the feed tube, then you may have to loosen the cam lever - this is done by rotating the cam lever (anticlockwise). Once your loader is pushed all the way down into the feed tube, close the cam lever. If your loader is loose, you may need to open the cam lever, and tighten it (by turning clockwise) to adjust the cam system to hold your hopper tightly. Only ever adjust your cam lever by one turn at a time to prevent overtightening.

DO NOT OVER TIGHTEN YOUR FEED CLAMP! OVERTIGHTENING MAY RESULT IN DAMAGE TO YOUR LOADER OR CLAMP.

Removing your loader

Open the clamp by swinging the lever on its hinge. This will loosen the loader and allow you to remove it easily. If it does not remove easily, then it means that you have the cam lever overtightened.



USING YOUR CLONE

To get the most out of your Clone, make sure that you follow the instructions in this section to ensure that the Clone is adjusted correctly.

Adjusting the velocity

Your Clone is equipped with a single regulator in the frame, to adjust the velocity adjust the regulator setting. Use an 1/8" allen key from the set provided, and use only small adjustments whilst checking over a chrono. Turn anti clockwise to increase velocity.

DO NOT ADJUST YOUR VELOCITY ABOVE 300FPS, AND ALWAYS OBEY LOCAL LAWS AND REQUIREMENTS.

Adjusting the trigger

Your trigger has four adjustment screws, they are located in the front face of the trigger and also on the upper face. In order of top to bottom, they are the trigger rest point, spring tension, actuation point and stop point.

You can easily adjust these screws to personalise the feel of your trigger.

CAUTION! WHEN ADJUSTING THE SWITCH ACTUATION SCREW, MAKE CERTAIN THAT YOU DO NOT ADJUST THE SCREW IN TOO FAR, AS THIS MAY RESULT IN DAMAGE TO YOUR MICROSWITCH.



Adjusting your velocity



Replacing the battery

Remove the three screws holding the wrap around grip onto the left hand side of your grip frame. Gently remove the battery from the clip on harness. Replace the battery with a high quality alkaline 9V battery (type 6LR61).

ADVANCED SETUP

About the tourney lock

The marker board is equipped with a tourney lock system. When the tourney lock system is activated, the marker cannot be reprogrammed on the field - making it tournament legal.

If your board is in locked mode, you can view your settings, but a lock indicator will be shown on the right hand side of the screen, indicating that your board will need to be unlocked before settings may be changed.

The lock status can be changed by opening the left hand side of the marker wrap around grip to gain access to the circuit board. The tournament lock is a black button. tap the button and you will see a tourney lock screen. Use the scroll button to change the status to off, then hold the trigger to confirm. if done correctly, you will now be able to adjust the settings on your board.

Programming the software

To program the board, hold down the trigger whilst turning the marker on. When done correctly, you will see a message on your display screen indicating that programming mode is loading. You must continue to hold the trigger until the program mode is loaded, then release the trigger.

Categories

Inside the programming system, settings are organised into categories. Select the desired category by scrolling down with the scroll button (⏮), or up with the power button (⏻). Enter the category by holding the trigger.

Once inside a category, you can use the scroll and power buttons to scroll through to different settings. They may be adjusted by holding in the trigger, then adjusting the value with the scroll or power buttons.

Menu Tree

Fire Mode	Settings	Preferences	System
-Preset	-Dwell	-Boot screen	-Total shots
-MAX ROF	-Debounce	-Sound	-Version
-ROF cap	-Eye delay	-ROF meter	-Zero pressure
-Ramp config	-Eye sensitivity	-Back	-Back
-Back	-Bolt delay		
	-Clearing shot		
	-FSDO time		
	-FSDO dwell		
	-Back		

Fire mode category

The fire mode category has all settings related to how your marker behaves when firing. details on the settings are given below:

Preset - a range of preset setups for common situations

MAX ROF - a setting for the rate of fire cap

Ramp config - details for ramping behaviour (this is only available for ramping modes)

Settings category

This category contains the detailed settings for the gun. These should only be changed by advanced users, or if directed to by a MacDev tech. Incorrect settings may cause your marker to behave erratically or poorly.

Dwell - the amount of time your solenoid is given power - the Clone 5 should be set to a maximum of 12ms. If the weather is very cold, or your marker requires it, you may set this a little higher.

Debounce - the amount of bounce filtering applied by the software. This setting may be increased to remove unwanted trigger bounce.

Eye delay - this is a parameter used to give a paintball time to settle in the breach of the gun. If you have unexplained ball breakage, then you may need to increase this setting.

Eye sensitivity - the sensitivity of the software to changes in your eyes. Please do not change this parameter unless directed (default 10).

Bolt delay - a time used in the software for effective tracking of the paintball bolt. Please do not change this parameter unless directed (default 8ms).

Clearing shot - a clearing shot function will allow the user to force a shot by holding the trigger in - even if the eyes cannot detect a ball. Set this to off, if you would not like to use this function.

FSDO time - FSDO stands for First Shot Drop Off. If you leave your gun for some time, and the first shot is lower than it should be, then you can use this parameter to correct it. This parameter is the time that the software waits before correcting for FSDO.

FSDO dwell - this is the amount of extra dwell given to the solenoid to overcome FSDO - if directed to do so by the above parameter.

Preferences category

This category contains settings related to the user experience.

Boot screen - The boot screen can be disabled if desired.

Sound - sound can be disabled if desired.

ROF meter - the settings for the ROF meter may be changed here. You can adjust the number of shots sampled, and if the maximum is held to the peak (peak hold).

System category

This category contains system information and settings.

Total shots - total shots since your board was made.

Version - current software version.

Zero pressure - This is used to zero your pressure transducer. If your pressure transducer is reading incorrect values it can be zeroed here. You must have your gun empty of all pressure before performing this action - if it is not, you will get incorrect transducer readings.

Using an RF transmitter

Your stock board has provision for an RF transmitter attachment. To use the RF transmitter function, you must plug a compatible RF transmitter module into the RF transmitter plug (directly under the eye plugs on your board), and it will be activated automatically.

Using the USB connector

Your stock board has a mini USB connector on the bottom of the board to the right of the 9V battery. The USB connectivity may be used to update your software via a standard USB/mini USB cable.

Never update your board with software unless it has been downloaded directly from the MacDev website (www.macdev.net), the use of non genuine software on your stock board will immediately void your entire marker warranty.

Maintaining the inline regulator

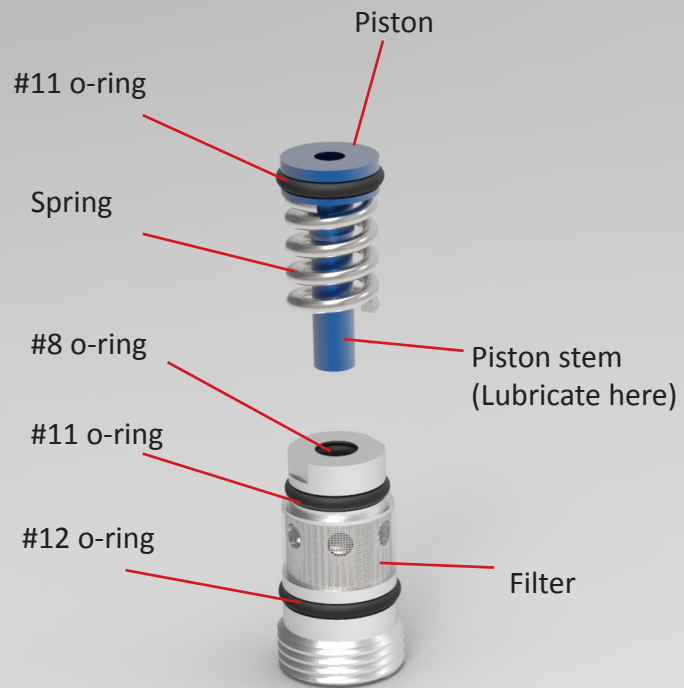
Your inline regulator regulates the pressure from your air system down to the pressure used to fire your marker. It is very important that your inline regulator is working well, if not, you may experience problems with velocity fluctuation or shutdown.

Before working on your inline reg, make certain that the air supply is turned off (via the venting ASA), and safely fire any gas out of the gun to ensure it does not have any residual pressure.

To access the regulator, remove the left hand side of your wrap around grip. This will allow you to unscrew the body of the regulator.

Clean the inside of the frame bore with a q-tip, and remove old grease from the regulator piston. Apply new grease to the piston shaft, and the #11 o-ring on the piston, as well as the #8 o-ring.

Apply new grease to the inside of the frame bore before re-installing your regulator.



Unscrew regulator from frame
(degass marker first)

TROUBLESHOOTING

If you are experiencing difficulties with your marker, please check this table first to see if there is an easy solution listed. If at any time you are unsure about how to work on your marker, please contact a certified MacDev technician or service centre.

Symptom	Possible Cause	Solution
Although a fresh battery has been fitted, your marker will not turn on	The battery has not been fitted correctly	Ensure that the battery is firmly connected to both terminals. Ensure that the positive (+) terminal is connected to the positive terminal on your battery.
Your marker leaks from the solenoid	Leaking bolt #16 o-ring	Clean and relubricate the drivetrain with particular attention to the bolt o-ring #16. Replace if necessary.
	Solenoid installation or operational fault	Check the solenoid is mounted correctly. If mounting is correct and the seal is in place, contact your local tech.
Your Clone uses excessive air	Keg internal number 19 o-ring leaks	Relube and check the keg o-ring. Replace as necessary.
	General leak	Make certain that there are no leaks from your gun or air system wasting your air supply.
The beam sensor is not reading correctly	Eyes are dirty	Check that the eyes are clean and not blocked.
	Eyes are faulty	Replace the eye pair.

Symptom	Possible Cause	Solution
Your Clone is chopping paintballs	Beam sensor is turned off	Always play with the beam sensor enabled.
	Beam sensor is dirty or blocked	Clean the breach, bolt and sensor.
	Loader is set on a force setting too high for your paintballs	Some force fed loaders can apply enough force to break a fragile paintball. If this is the case, consult your loader manual to reduce the force setting.
	Detents are missing or incorrectly installed	Replace or re-install your detents.
	Eye delay too low	Increase the eye delay (pg 13)
Your Clone will not fire	The trigger is set up incorrectly	Ensure that the trigger actuates the micro-switch by adjusting the actuator screw.
	The beam sensor is on, and there are no paintballs loaded	Load some paintballs.
	The solenoid is not plugged in	Plug the solenoid into the board.
Your Clone fires high on the first shot or inconsistently.	Creeping regulator	Clean and lubricate the regulator, ensure that the seat and piston are in good condition.
Your Clone fires low on the first shot	Sticking drivetrain	Clean and relubricate the drivetrain. If you continue to have problems: -increase the dwell by 1-2 ms. -increase the ABS parameter on your board.

