Pro-Team Products, Inc.

EMAG MICRO 2000 Electronic Paintball Gun

Maintenance Manual Version 2.0

Introduction

This manual has been prepared by Pro-Team Products, Inc. in association with AirGun Designs, Inc., to assist new owners in the care and maintenance of their electronic automag-based gun.

While the EMag-Micro 2000 is compatible in most ways with its AirGun Designs counterpart – the EMag – there are significant differences which can affect performance. This manual is intended to support Pro-Team Products' version of this fine marker. Should you be using this manual as a reference guide for other versions of this marker, please be aware of the differences.

Your Pro-Team Products EMag Micro 2000 is covered under limited warranties by both Pro-Team Products (workmanship, body parts) and AirGun Designs (A.I.R. Valve and electronics). Please carefully read the warranty return procedure at the end of this manual if you wish to return your marker for warranty work.

SAFETY

WARNING: THIS PAINTBALL MARKER IS NOT A TOY! This paintball marker should be treated as a dangerous instrument and should always be treated with respect. Never point a paintball marker at anyone not properly attired. This paintball marker can cause serious bodily injury including, but not limited to, blindness or even death. Please read all safety instructions and directions in this manual *before* using this paintball marker. **Always wear approved paintball goggles and mask whenever you handle this paintball marker!**

Do not point or shoot this paintball marker at animals. Do not point or shoot this paintball marker at any person unless you and your target are engaged in paintball activities and are wearing proper safety gear including approved paintball goggles and mask. Never shoot anyone at close range! Never load this paintball marker with anything except approved paintballs. Never put anything down the barrel except paintballs, barrel squeegees or barrel plugs. Do not attempt to repair this paintball marker by yourself. Follow all maintenance instructions carefully. If you are unsure about any aspect of the maintenance procedures contact your local dealer or Pro-Team Products, Inc. at (904) 437-3375.

This paintball marker is always armed and cocked when an air supply is installed. Always insure that the safety (located behind the grip) is engaged in the SAFE position and install an approved barrel plug PRIOR TO attaching or installing an air supply. Disengage the safety and remove the barrel plug only when on a playing field, the game has started and all players are wearing proper safety gear. When the red ring of the safety pin is showing, the safety is off and the paintball marker *will* fire.

Always chronograph this paintball marker before using it. Never shoot this paintball marker when the chronograph readings exceed 300 fps! There is a blow-off valve incorporated into the valve mechanism that will release air pressure if pressure exceeds a predetermined amount.

This blow-off valve is factory set and is not user adjustable. Remember to wear proper approved goggles and masks when chronographing your paintball marker.

Please refer to the appendix 'Chronographing the EMag-Micro 2000' for the proper procedure for accurately chronographing this paintball marker.

Prior to disassembly remember to wear approved safety goggles or mask to prevent accidental injury. Never point the paintball marker at anyone or anything that could be injured or damaged, if shot. Always remove the air source from the paintball marker and dry fire in a **safe** direction before disassembling. The velocity adjusting nut is on the back of the regulator body. Do not disassemble the velocity adjusting nut while the paintball marker is under pressure. If air is leaking out the back of the velocity regulator nut the paintball marker is over-pressurized and will shoot at a higher velocity than intended. Reduce the regulated pressure by backing off the velocity regulator nut (by turning the velocity regulator nut COUNTER-CLOCKWISE when facing the rear of the marker) and re-chronograph the paintball marker. If problems persist call your dealer or Pro-Team Products Inc.

WARNING: Do not put your fingers into the breech area, down the ball feed tube or barrel while firing the paintball marker; serious injury could result.

When set in the Manual Trigger Mode (selector switch pointing towards the battery pack) the pressure regulator allows gas under pressure to push the trigger forward after shooting. An excessively hard trigger pull indicates over pressure in the system. Do NOT fire a paintball marker that has excessive trigger pull; call your local dealer or Pro-Team Products, Inc.

COMPRESSED AIR ONLY

Your E-MAG MICRO 2000 is designed to run on compressed air only! It will not function at all on CO_2 no matter what hoses, expansion chambers, etc. you use. We recommend that you purchase a high-quality 3000 psi compressed air tank and regulator for your E-MAG MICRO 2000. The maximum input pressure to the paintball marker should be above 600 psi and less than 1000 psi for best performance. Pressures over 1000 psi will damage the regulator and reduce performance.

NOTE: Attempting to operate the E-Mag Micro 2000 using CO2 can potentially ruin the marker beyond repair and will void the warranty. Maintenance of a E-Mag Micro 2000 which has had CO2 introduced into the A.I.R. valve system is NOT a warranty-covered repair.

FAST START

This is a quick overview of how to use the E-MAG MICRO 2000 for the experienced player. Introducing air pressure to the paintball marker will charge and cock the system. The system is a blow forward from open bolt, similar in concept to a cork in a champagne bottle.

The barrel utilizes a 'Cocker-style' thread and is compatible with all barrels intended for use with WGP Autococker style markers. The velocity adjustment nut is on the back of the valve body and requires only one turn to adjust from 200 to 300 fps. Air venting out of the back of the

regulator indicates that the internal blow-off valve is responding to over pressure in the system and the velocity should be turned down.

Field stripping is accomplished by unscrewing the knurled field strip screw located underneath the frame while the air supply is off. THE TRIGGER MUST BE PULLED (WITH SELECTOR SWITCH SET POINTING TOWARDS THE BATTERY HOUSING) TO SLIDE THE VALVE BODY OUT. There is a locking pin for alignment in the regulator body which allows the valve body to only come out part way before you must twist the valve body clockwise to continue sliding out the back. Reinstall in the same manner. Once removed, the entire valve and bolt assembly is available for cleaning.

Maintenance on all active o-rings can be accomplished without tools.

When adjusting the velocity regulator, dry fire the paintball marker several times before chronographing to allow the regulator piston and spring to seat properly. Always start below your intended velocity and work your way up. When firing the paintball marker, it's important to remain aware of how many balls are in your loader. **If the quantity runs too low the slight blowback past the bolt will bobble the balls in the feed tube, thus preventing a positive ball feed. This increases the likelihood of ball breakage.**

Always use fresh, high-quality paintballs. The blow forward action aggressively pushes the ball into the barrel before firing and we have found that lower grades of paint cannot withstand the acceleration.

FIRST TIME PROBLEMS

There are several first time problems to watch out for. Many times the paintballs will not feed because the recoilless design does not juggle the loader. You must remain aware enough to keep the balls feeding. We recommend that you use an agitator type loader to keep the balls feeding.

When attaching an air system to the E-Mag Micro 2000, insure that the trigger rod (visible behind the trigger) is all the way forward – touching or almost touching the back of the trigger – before introducing air into the system. If the rod is not all the way forward, the marker can be shaken or gently tapped to move the rod forward. If the trigger rod is not all the way forward when an air system is attached, gas may leak down the barrel.

Next, the bolt can stick forward causing the trigger to lock due to either paint chips wedging between the bolt and breech or, when degassing the paintball marker, caused by turning off the tank and shooting those last few blooping shots. When the bolt sticks forward the trigger will not come forward. Remove the barrel and USING A SQUEEGEE push the bolt back until the trigger clicks forward.

The paintball marker will give very little indication that it is running out of gas; by the time you see the velocity drop you are 20-30 shots away from total shutdown. Additionally, if you use a compressed air tank with an on/off valve make sure you open it all the way. The marker will experience shoot-down (lower velocity shots), leaking of gas or non-firing conditions when the tank pressure is equal to or just slightly above the set input pressure on the marker.

OPERATING MODES

The E-MAG has three distinctive modes of operation with each having their respective characteristics

1. **Mechanical Mode:** Indicated by the selector switch positioned so that it points toward the Battery Pack. In this mode the electronic system is disengaged. This can be accomplished by either removing the battery pack or installing the electronic interrupter.
   - This mode is purely mechanical.
   - No shot count, timer, burst mode, etc… is available in this mode.
   - This mode provides a "Reactive Trigger", meaning the trigger is returned forward by air pressure supplied from the A.I.R. valve pushing the trigger rod forward.
   - There is longer trigger travel and greater required pressure to pull the trigger in this mode.
   - Partial trigger pulls (aka "half stroking") are possible in this mode.
   - In this mode the E-MAG MICRO 2000 performs like an Automag RT or Automag RT Pro.

2. **Electronic Mode:** Indicated by the selector switch positioned so that it points toward the Safety at the rear of the marker frame. In this mode electronic firing is on.
   - This mode "purely" electronically controlled.
   - The trigger pull will be light and short in this mode.
   - This mode will not allow "half stroking". Each time the trigger is pulled the electronics will activate causing a complete firing cycle to take place.
   - Semi-Automatic, 3-Shot Burst and 6-Shot Burst modes are available in this mode provided the proper jumper is installed (see Jumper Installation later in manual).
   - The Shot Counter, Count-Down Timer and various other LED indicators are active in this mode.
   - The firing cycle is triggered via a hall affect sensor located to the rear of the trigger in this mode.
   - This mode eliminates the "Reactive Trigger" meaning the trigger is returned via the return magnet system located above and forward of the trigger.

3. **"Hybrid" Mode:** Indicated by the selector switch positioned so that it points toward the Battery Pack and the electronic system is engaged. This can be accomplished by removing the electronic interrupter from the battery pack, thus making the battery pack operational.
   - This mode is a mixture or "Hybrid" of Mechanical and Electronic modes.
   - The firing cycle is controlled electronically and is triggered via the hall effect sensor.
   - The trigger is "Reactive" and is returned via air pressure supplied from the A.I.R. valve pushing the trigger rod forward.
   - In this mode the Shot Counter, Count-Down Timer and various other LED indicators are active.

LUBRICATION

We find that customers who properly lubricate their paintball markers once a week have the fewest problems. To lubricate your E-MAG MICRO 2000, place 6 drops of Pro-Lube, (or other non-petroleum based light lubricant) into the back bottle adapter. Then gas up and dry fire the paintball marker several dozen times with the barrel removed to prevent oil build-up in the barrel. This cycles the oil throughout the marker and provides needed lubrication to internal parts. For markers utilizing air systems which do not attach to a back bottle adapter, place 2 to 3 drops of oil into the hole marked 'oil' which is located on the AIR valve assembly itself.

VELOCITY ADJUSTMENT

The velocity of your E-MAG MICRO 2000 is adjusted by increasing or decreasing the regulated pressure. This is accomplished by turning the regulator adjusting nut located on the back of the regulator body. Only a minimal amount of rotation is necessary to adjust the velocity. We recommend that you always start at a low velocity setting and continue to screw the adjustment clockwise up to your desired setting.

Always shoot several shots to seat the regulator piston and spring. High velocities will cause the blow-off valve built into your system to vent air out the back of the regulator body. If you ever hear air venting, stop and re-chronograph the paintball marker immediately. Optimal performance is obtained by setting the velocity in the 270-280 fps range. Occasionally grease the threads of the velocity adjusting nut, preferably with a silicone-based grease.

BATTERY

The E-MAG MICRO 2000 features a Nickel Metal Hydride (NMH) battery. This more expensive type of battery is being used due to its lack of "memory". This means that you may "top-off" the battery at any time without it developing a "memory" which reduces future useful power.

The E-MAG MICRO 2000 battery provides approximately 18 volts when fully charged. The E-MAG MICRO 2000 will function on as little as 14 volts. The battery should provide approximately 20,000 shots on a full charge.

To charge the battery, you must:

- Unscrew and remove the battery retaining screw (interchangeable with a field strip screw)
- Slide the battery down and off the battery rail (located in front of the trigger guard)
- Slide the battery into the charging unit and press the field strip screw through the hole in the charging unit and into the battery.
- Insert one end of the power cord adapter into the charging unit and the other into a 12 volt power source such as an automobile cigarette lighter.
- While the battery is charging the light on the charging unit will appear red. Once the battery is fully charged the light will change to green.

ELECTRONICS

The Emag Micro 2000 is equipped with an on board computer that controls the firing of the gun in electronic mode. The computer is programmed via the two push buttons on the rear of the grip frame. The top button pages through the menu selections, the lower button selects from the current menu of options. The LED display in the side of the grip frame displays the following

options when the top menu button is pressed and will display for 6 seconds before shutting off to conserve battery life:

Timer – displaying as “00:00:00”
Shots Fired – displaying as “SHTS #”
Maximum Firing Rate – displaying as “SPS #”, where the number displayed can be either 8, 9, 10, 11, 12, or 13.

FIRING MODES

Your Emag Micro 2000 comes programmed with three firing modes, semi auto, 3 shot burst and 6 shot burst. These modes are only available with the mode jumper installed.

DISPLAY

While the marker is powered up the display will flash one pixel every few seconds to show that it is activated.
When the battery is low it will flash “low bat.” every few seconds.
When the game timer gets within three minutes of end of game it will flash the time left on the display every four seconds.

Press top button to show:

Game timer, displays minutes left in the game.

Press lower button: stops clock or starts timer if not running. Game timer can also be started by firing the gun.

Press top button to show:

firing mode either one shot (semi auto), 3 shot burst, 6 shot burst
3 shot burst fires at a maximum of nine shots per second
6 shot burst fires at a maximum of nine shots per second.

NOTE: This menu will only display if the mode jumper is installed on the circuit board. Tournament rules require this jumper to be removed before play. Firing mode always defaults back to semi auto when the gun is powered down.

Press lower button: to select firing mode

Press top button again to show:

Number of shots fired since last power up.

Press lower button: does nothing

Press top button again to show:

Total shots fired by this gun in its lifetime.

Press lower button: does nothing.

Press top button again to show:

Shots per second limit.

This will limit the firing rate to the indicated number of shots per second. The number is stored in memory and will come up again when you power up.

Press lower button: to change shots per second.

Press top button again to show:

Game timer

this will allow setting of the count down timer from five to thirty five minutes in one minute increments. This setting will be saved in memory when power is off.

Press lower button: to increment timer between 5 and 35 minutes.

Press top button again to go back to top of menu tree.

CLEANING

Always remember to wear approved paintball goggles and mask when cleaning your paintball marker if the marker is pressurized.

Standard Cleaning:

After each use a paintball marker should be disassembled and all the exposed parts cleaned and inspected for wear or problems. Lightly lubricate all surfaces and re-assemble according to instructions.

WARNING: DO NOT USE “CLEANING” LUBRICANTS SUCH AS FOR FIREARMS OR SPRAYS SUCH AS “WD-40”. Lubricate with quality lubricants designed for pneumatic devices such as “Pro-Lube”.

PAINTBALLS

There are many different kinds of paintballs on the market, all with different specifications. The one thing that is consistent is that low quality paintballs will perform poorly in the E-MAG MICRO 2000. Always use fresh, high-quality paintballs and try many different types to find the best one suited for your paintball marker and playing conditions.

LOADER

An agitated loader such as a VL Revolution is mandatory for the efficient and effective use of your E-MAG MICRO 2000. Always keep at least twenty balls in the loader when fast firing. Your Emag MICRO 2000 is equipped with the longer bolt to reduce blowback.

In order to assure the optimal feed rates and minimize ball chopping we recommend the use of Airgun Designs **Warp Feed** friction drive system. The **Warp Feed** system will consistently feed at a rate equal to the maximum firing rate of the E-MAG MICRO 2000.

Ball breakage may occur with the E-MAG MICRO 2000 due to the incredibly high rates of fire achievable. If you find that the balls are cut in half in the breech, consider the purchase of a positive feed loader system combining an agitator with a **Warp Feed**.

BLOW-OFF VALVE

The blow-off valve is self-contained in the regulator piston and is not user adjustable. It is a safety device for venting air from the paintball marker should abnormally high pressure occur in the regulator or air chamber. Always check your velocity any time the blow-off valve has vented. **WARNING:** End-user adjustment of the regulator piston will void the warranty.

ACCESSORIES

Pro-Team Products and Airgun Designs manufacture a variety of Warranty-Approved add-on products for your paintball marker, as well as a variety of promotional items such as hats, t-shirts, patches, and gun cases; please call us at (904) 437-3375 if you would like a product brochure and price list or visit our or AGD's website at www. proteamdirect.com.

TECHNICAL SUPPORT

Please refer to this manual for basic information about your E-MAG MICRO 2000. If you have questions about your E-MAG MICRO 2000, please call our Technical Support staff at (904) 437-3375. Our technical support staff is available Monday through Friday between the hours of 9:00 a.m. and 4:00 p.m. (Eastern Time). For general or after-hours questions, email your inquiry to info@proteamproducts.com.

Please call us before you send your paintball marker to us for repair! Our Technical Support staff might be able to solve your problem over the telephone. If your paintball marker needs to be returned to us for repair we need to verify that you have registered your E-MAG MICRO 2000 by mailing in your Warranty Registration card, that we have your current address and telephone number on file, and that you are aware of our warranty repair policies and the anticipated turnaround time.

CHRONOGRAPHING PROCEDURE

The procedure used for chronographing the EMag Micro 2000 depends upon the 'mode' which is set.

When the marker is in 'Manual' operation (selector switch pointing towards the battery pack), or 'Hybrid' (selector switch pointing down) the standard 'RT' valve chronographing procedure

should be used. This is accomplished by firing the marker and holding the trigger back. On each subsuquent shot, the trigger should be rapidly released, pulled again and held in the rearward position.

When the marker is in 'Electronic' operation (selector switch pointing towards the rear) the marker can be chronographed using the standard procedure.

TROUBLE SHOOTING GUIDE

SYMPTOMS	PROBLEM	SOLUTION
Marker will not fire in electronic mode	**Battery not charged Lockout pin not removed Selector switch set to Manual**	**re-charge/replace battery remove lockout pin set selector switch to electronic**
Marker can not be set in burst modes	**Burst mode jumper not install**	**install jumper**
Marker will not fire in any mode	**Air system not hooked up Air system not charged**	**Attach air system Re-fill air system**
Air Leaking out back of marker	**System over-pressurized**	**lower velocity with adjusting nut; clean regulator piston; replace regulator piston o-ring ***
Air leaking out barrel	**Bolt not sealing in power tube**	**replace power tube spacer with next largest spacer; clean/replace power tube o-ring ***
Bolt 'sticking'	**Bolt hammed in power tube**	**replace power tube spacer with next smallest spacer**