E-Mag Introduction

by Bill Mills
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The long awaited introduction of the E-Mag, Airgun Designs electronic version of the Automag, came at the Zap International Amateur Open tournament in August, 2000.

[Airgun Designs]

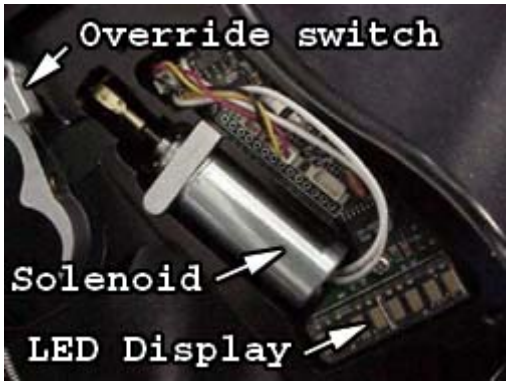
[What do you think? Add your comments in WARPIG's TECH TALK FORUMS.]

AGD launched the E-Mag's marketing campaign with a 4 page insert in *Paintball News* released on August 2nd, concurrent with a re-vamp of their web site. That night, Airgun Designs' president, Tom Kaye participated in an E-Mag question and answer tech conference in PigChat.

The E-Mag combines the reliability, and fast recharging valve system of the Automag RT with electronic triggering technology. The unveiling of the E-Mag also set aside many false rumors that have been circulating on the internet and through web sites, in which photographs and video clips of custom modified mags have been represented as being E-Mag prototypes.

The E-Mag is based on the ReTro Valve, keeping compatibility and parts fit consistent with standard mag rails and frames, rather than the more complex RT rail and receiver structure. The future of AGD products is clearly the ReTro valve structure, which can maintain velocity at rates over 20 shots per second. The use of the ReTro valve also means that the E-Mag will operate on compressed air only, not CO_2. While early plans for both the E-Mag and the RT-Pro (a lower cost

Automag RT, based on the ReTro Valve) were to use a vertical feed, recent advances in feed technology have led them to return to powerfeed designs that can take paint from above or below the receiver.



Where the E-Mag differs in feel from an Automag RT, or ReTro valve equipped Automag is in the trigger. The E-Mag uses a reactive magnetic trigger, which even has a mechanical override. Instead of springs, stackable (to change return strength) magnets provide a very light resistance. There is no switch in the trigger assembly to be fouled by dust, water or debris. Instead, a sealed hall effect sensor picks up the movement of the magnetic field from another magnet in the trigger, and send a signal to microprocessor in the grip frame.

The microprocessor in the grip frame controls the power, supplied by either a pair of 9v batteries, or memory free NiMH rechargeable cell pohone batteries which are stored in the removeable foregrip. A feature unique to the E-Mag among electronic paintguns is the mechanical override. A small switch above the trigger can be rotated 90 degrees to allow the trigger to be pulled far enough to mechanically actuate the sear. This override means that if the batteries die, or electronics fail, the E-Mag still can operate with the full performance of an Automag RT. The reactive effect of the RT valve technology is available when the mechanical override is activated, even if the electronics are turned on. Once the E-Mag fires, gas pressure in the on-off valve assembly kicks the trigger back forward faster than a return spring can, creating a hybrid electro/reactive trigger mode.

The electronic actuating system of the E-Mag is rather simple in structure. A solenoid pulls the sear when it receives electrical current from the microprocessor board. The solenoid is a wire coil that generates a magnetic field to pull on an iron core that is linked to the sear. An LED (not LCD) display in the grip frame displays the selected mode, shot counter, game timer, and maximum rate of fire information. Two pushbuttons in the rear of the grip select modes and change settings.

Which firing modes will be in final production models have not been finalized. The first shown E-Mags can fire in semiauto, 3 shot burst, 6 shot burst, and full auto, at rates up to 20 shots per second (firing this fast is possible with feed systems like the AGD Warp Feed), which is the recharge limit

for the valve and mechanical operation of the paintgun. Beyond 20 shots per second, the E-Mag could suffer velocity drop-off.

Current plans for production models include electronically limiting the maximum rate of fire to the industry agreed upon 13 shot per second limit. The full auto has only been used to demonstrate the 20 shot per second capabilities of the E-Mag and Warp Feed, and will not go into production models.

The E-Mag is scheduled to be released to market in September of 2000. Concurrent with its release is the release of the eMag Micro 2000, an aluminum receiver vertical feed version with different styling and Autococker style barrel threads manufactured by Pro Team Products under license from Airgun Designs.