

Comparison Qualities of the Wireless TASER (XREP) and the Mossberg X12 LLS

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ABSTRACT

In July 2009, TASER International announced the release of the less-lethal eXtended Range Electronic Projectile (XREP) with claims of delivering incapacitating electrical shocks to a subject up to 100 feet away. This round is fired from a specialized 12 gauge shotgun that is dedicated to firing the XREP less-lethal platform. Mossberg has developed a system based on the model 500 that will only fire the XREP round. The uniqueness of the round is challenging, but does not prevent traditional firearms examination and identification of both the fired XREP payload and the shotshells.

Introduction

Traditionally, less-lethal munitions delivered at distances greater than thirty feet have been impact munitions such as bean bags, sponge rounds or rubber bullets (ARWEN). Accuracy and effectiveness are often sacrificed for safety as they rely on blunt trauma/pain compliance. Control of unruly suspects has been safer and more successful with the emergence of electronic control devices. The most popular law enforcement handheld electronic control device, the TASER X26, introduced in 2003 is widely used by police departments all over the world. Although quite successful in the field in reducing injuries to both suspects and officers [1], the device has a maximum range of thirty-five feet.

In July 2009, the eXtended Range Electronic Projectile (XREP) was released boasting to deliver TASER X26 type effects, but at a 100 foot effective range. Like the bean bag and other less-lethal predecessors, the XREP is designed to be delivered by the law-enforcement staple, the 12 gauge pump shotgun.

Historically, there have been issues when the same system was used to deliver both lethal and less-lethal rounds. On occasion, the result of the deployment has been fatal when the operator mistakenly chambered the wrong round. In an attempt to combat that occurrence, TASER International partnered with Mossberg to develop the Radial Key™ ammunition design. With this platform, the firearm will only fire the less-lethal XREP 12 gauge shotshell.

The X12

The TASER X12 LLS (Less-Lethal Shotgun) is based on the standard Mossberg model 500 platform with a specially designed bolt face which only accepts the XREP shotshell (Figure 1). The barrel is custom rifled with 1 in 60" right twist (6 lands and grooves) and has a cross bolt safety (to be similar to a Remington model 870).

The breechface of the X12 bolt is manufactured using standard methods but with a ridge along the upper half of the bolt face. A protruding ring along the edge of a portion of the breechface



Figure 1

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of the X12 (Figure 2) prevents the firing of traditional 12 gauge ammunition. The inner diameter of the XREP shotshell is recessed inside the hull allowing fire in the X12 (Figure 3). Conversely, standard shotgun ammunition will not fire in the X12. The older versions of the XREP would not fire in traditional shotguns, but they have been recently modified to be fired either the X12 or a standard 12 Gauge shotgun. The primers of newer XREP shotshells are flush with the base (Figure 4).



Figure 2: XREP "Old Version" showing protruding ring around edge of breechface



Figure 3: "Old" XREP shotshell (left) vs. Traditional shotshell (right)

The "Wireless" concept

The XREP is a self-contained electronic control device. The XREP put simply is the circuitry, probes and wires of an X26 origami-ed to the size of a standard 2 3/4" 12 gauge payload (Figure 5). The round is activated in the barrel when



Figure 4: "New" XREP shotshell (left) vs. "Old" XREP shotshell (right)

it leaves the shell. The nose section impacts the target with four probes that imbed in the conductive surface, the rear payload unwinds exposing a series of sharp needles called "cholla" probes (Figure 6). The device delivers 20 seconds of electrical pulses between the probes at peak 500V to the target[1]. According to the manufacturer, the higher voltage of the handheld X26 (50,000 V peak) is not needed due to direct skin contact expected by the payload[1]. Study of the accuracy and effectiveness of the XREP round is currently ongoing and will be published at a later date.

XREP Training Round

In an effort to keep costs down for agencies that choose to deploy the XREP, TASER International offers a training round so officers may range qualify without the expense of the live electrical payload. The shape and weight are roughly equivalent. During our testing, the muzzle velocities/energies were slightly less than live rounds. In late 2009, the color of the training rounds was changed to red, but the construction is the same as our samples with the exception of wider stabilization fins (Figure 7).

Microscopic Qualities

When microscopic examination and comparison is needed, we determined that the training rounds were suitable media to generate tests for comparison to the live XREP rounds. Individual characteristics were present on the fired rounds although qualities of the construction make identification to a specific X12 difficult. Both rounds have three stabilizing fins near the base to increase reliable trajectory and flight characteristics. This outer surface area of the fins does not engage the entire rifling bearing surface so orientation can be difficult. A band around the lower 1/4 of the training round captures more of the microscopic qualities from the barrel. Both of these areas can be compared to fins on the live

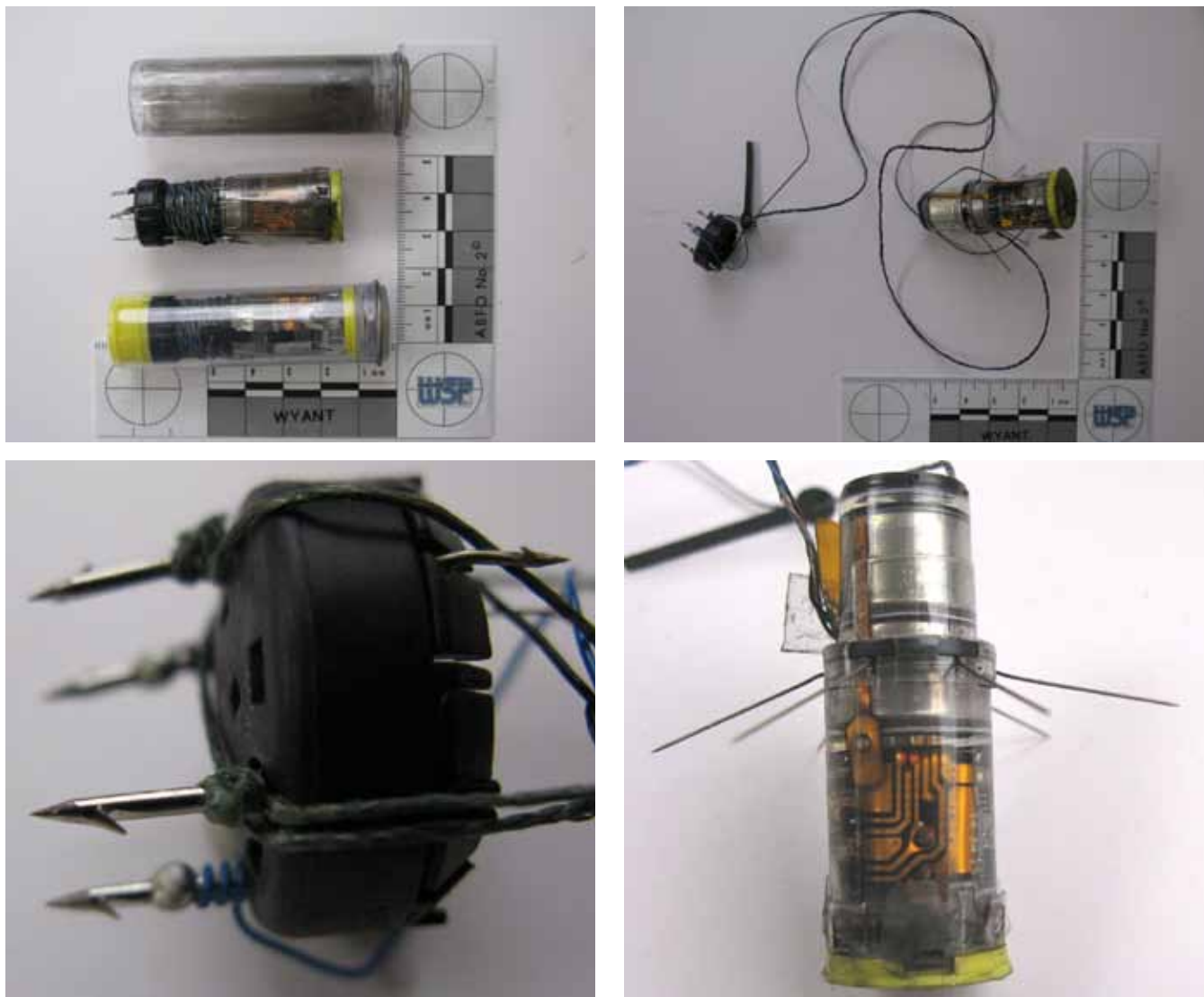


Figure 5: Payload

(evidence) rounds (Figure 9).

In addition to the main payload of the XREP round, the over load cap (currently black for the training rounds and yellow or black for the live rounds) and the Mylar sleeve that surrounds the cholla probes were determined to be valuable for microscopic comparison (Figure 10). These components fall clear of the round when deployed, so care must be taken for their collection at a crime scene.

Unfortunately during our evaluation, there was not one area that consistently marked well microscopically shot after shot. It is likely that multiple test rounds will need to be fired for a suitable comparison.

Shotshell Comparison

Although pressures are relatively low, microscopic identifications of fired XREP shotshells can be identified to an individual X12 based on the five shotguns that we compared. This was done through firing pin and breechface markings on the primer (Figure 11).

Conclusion

This less-lethal system has the potential to gain mass popularity. A case involving the X12 and/or the XREP could be submitted to a firearm's laboratory for examination. Like the X26 [2], in the post incident analysis of an XREP deployment, it will be imperative to collect all fired components of the round to aid in the identification to the associated firearm and



Figure 6: XREP Deployed

reconstruction of the event. The firearms examiner can utilize the training rounds to obtain exemplars to compare to the fired live XREP rounds.

Future Study

Our samples were obtained in late 2009 so full production models may vary. We currently have a study underway evaluating the accuracy and effectiveness of the newest XREP versus a forensic testing model previously developed for



Figure 7: Training Round (left) vs XREP (right)



Figure 8: Training Round Exploded

evaluating wound profiles from less-lethal impact munitions. Special thanks to Chris Myers and Tom Burns of CRT Less-lethal Inc for their contributions to this publication.

References

- [1] TASER International Version 16 training DVD
- [2] Wyant, R.T. "The Advanced TASER M26, X26: Forensic Considerations," *AFTE Journal*, Vol. 36, No. 4, Fall 2004, pp.267-274.

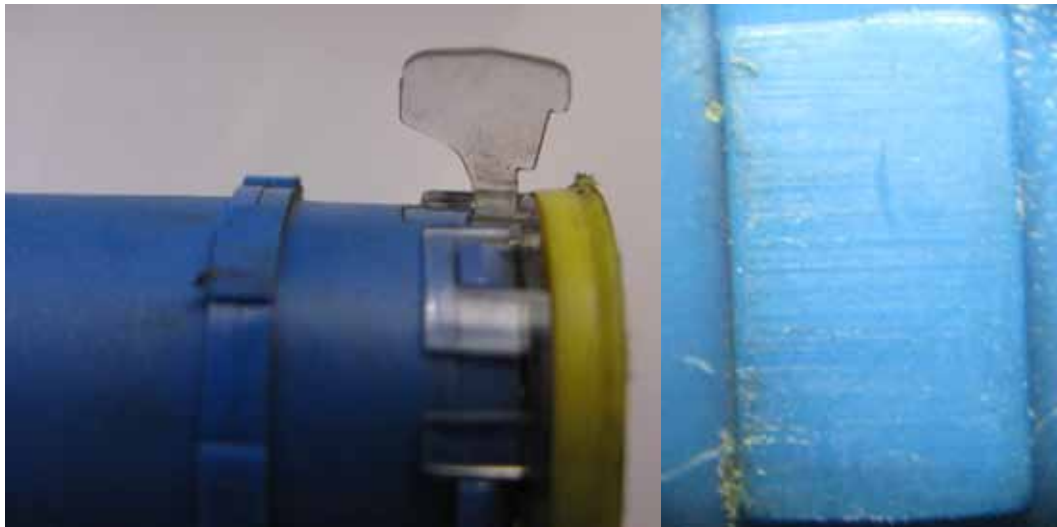


Figure 9: Microscopic Comparison Area on Training Round



Figure 10: Microscopic Comparison Areas on XREP

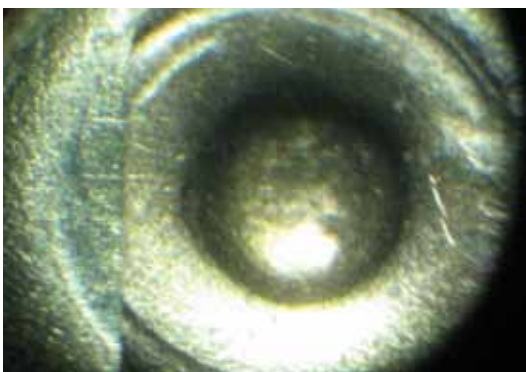


Figure 11: XREP Microscopic Comparison