

# Test & Evaluation

## Spec-Rest™

### Weapons Mount System

Date: 9 April 2010

**OVERVIEW:** After contacting Lone Star Field Products® of Garland Texas, Mr. Robert Black agreed to provide me with a complete Spec-Rest™ kit for the purpose of testing in support of Anti-Piracy operations in the Gulf of Aden. The Spec-Rest™ kit comes complete with additional yoke arms, screws, carrying case and a yoke arm extension for use with larger rifles that have a pistol grip chassis. The purpose of this report is to evaluate the Spec-Rest for use in maritime environments and determine its usefulness as a viable means to increase stability of precision shots with both carbines and special applications scoped rifles.

**EQUIPEMNT:** The following, is a list of equipment used during the evaluation

SPEC-REST™ SYSTEM	Included tripod and quad-pod	Needed Quick Clamp mount
M-4 CARBINE	5.56MM	16 inch BBL
DPMS .50 CAL. BOLT RIFLE	Lower, DPMS, upper,	Magazine fed
EOTTECH SIGHT	Holographic sight	
ACOG 4X	BDC	
LEUPOLD Vari-X, 6X18 PWR		

#### ASSEMBLY

1. The mount contains two primary groups; the weapons rest otherwise known as the Spec-Rest “HEAD”, and the tripod/quad-pod otherwise known as the “MOUNT”. The weapons rest contains numerous parts that require some assembly in order to ready the head for operation.
2. The mount is configured to accept a spindle that allows for the head to be quickly attached to either the tripod or the quad-pod. The telescopic tripod legs have two adjustment knobs per leg.
3. The Spec-Rest™ HEAD consists of a machined frame, a mechanical actuator, traverse break stop, gross vertical adjustment, fine tune vertical adjustment, bronze bushings, brass friction plates, and tightening screw knobs.



**Fig a: Spec-Rest™ “HEAD”**

4. During the initial assembly, and while attaching the yoke arm extension to the frame, we found that the powder coating on the parts made it very difficult because of such tight tolerances resulting in having to hammer the yoke assembly pins into place. Compounding this problem, we then attempted to remove the yoke assembly and had to use pliers to remove the pins, as one of them detached from the extension and remained inside of the frame insert holes.



**Fig. b**



**Fig. c**

## APPLICATION

1. We utilized the Spec-Rest™ weapons mount primarily as a stabilizing platform for use with the .50 caliber bolt action rifle, where the Ship Security Team (SST) could best employ it towards the aft of the vessel from the weather deck. This provided the SST with the ability to shift from either side of the vessel and observe potential high-threat targets while transiting the UKMTO corridor. We found that the tripod was easy to maneuver in most open spaces and could be carried over one shoulder while transporting the weapon inside of the Spec-Rest™ HEAD on the other.

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2. The quad-pod was positioned at an alternate location to serve as a supplemental firing position. In this case, the operator would remove the Spec-Rest™ HEAD from the tripod and move to the other location.
3. The Spec-Rest™ also served as an excellent platform for which to conduct battle sight zero of all shoulder-fired weapons prior to their employment. The use of the Spec-Rest™ for BZO at 25 meters on the M-4 carbines was incredibly stable. Shot patterns using the Spec-Rest™ as compared to the backpacks previously used as firing platforms showed significant improvement in grouping, leaving little to wonder about marksmanship skills and ship vibration.



**Fig 1: BZO M4 carbine**



**Fig 1.2: BZO M4 carbine**



**Fig 2: .50 cal employment**



**Fig 2.1: .50 cal employment**

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**Fig 2.2: .50 cal employment**



**Fig 2.3: .50 cal employment**



**Fig 3: M4 on tripod**



**Fig 3.1: M4 on tripod**

**PERFORMANCE;**

1. The Spec-Rest™ was tested for maritime conditions by leaving the mount fully exposed to the elements without any preventive maintenance or any form of lubrication for a period of 8 days. The mount and tripod were exposed to an average daily humidity rate of 49 % with a dry bulb temperature of 25 Celsius, and a wet bulb temperature of 21 Celsius. The dew point was rated as 10 Celsius, with wind speeds exceeding 20 knots. References for this information can be located in the Bowditch Navigational Manual.
2. During this period the mount was observed for corrosion, paint flaking, cracking, and operability of the adjustable components. After a period of 8 days, the Spec-Rest™ was removed from service for inspection and cleaning. The following pictures will provide a clear perspective as to the impact on the mount by the harsh maritime environment.



**Fig 4:** spindle head, “surface rust”



**Fig 4.1:** spindle head, “surface rust”



**Fig 4.2:** Mounting frame



**Fig 4.3:** Mounting frame

3. The Spec-Rest™ exhibited very little corrosion and only to those areas containing high carbon content specifically nuts and bolts, and the head of the spindle. The powder coating of the system exhibited cracking or peeling only at those points where the tripod leg tightening screws contacted the interior tripod legs. All of the mechanical components were fully functional after the 8-day period of exposure and exhibited no deficiencies in performance.
4. The yoke arms that were provided for weapons retention were very user friendly and could easily be molded to whatever design thickness of weapon that was to be used. We did however notice that the rubber coating on the yoke arms began to fail at the point of attachment (adhesive) to the arm after a few days of use. This appeared only on one yoke arm and seemed to be a minor issue. The yoke arm remained fully functional and we continued its use it throughout the deployment.



**Fig 5: yoke arm**



**Fig 5.1: yoke arm**

5. After cleaning and removing all surface rust from the system, a liberal coat of **Corrosion X**™ oil was used as prescribed by Robert Black. After an additional 5 days fully exposed to the environment, no surface corrosion appeared on the Spec-Rest and no other additional maintenance was required throughout the 28-day deployment.
6. During the test and evaluation (T&E) process, we discovered that the Yoke Arm Extension was an integral part for establishing the correct attitude of heavier caliber weapons in the mount. The extension allows the operator to adjust and compensate for those weapons chassis that may have pistol grips or where the stock is ergonomically formed, as compared to traditional rifle stocks.
7. In our application of the extension, it was noted by the operators that the existing fixed peg type attachment does not provide for ease of movement and that the range of movement is limited where the operator needs to quickly switch from one weapon to another. It is recommended that an accessory be fabricated in the form of a slotted rail with a cam lock so that the yoke extension may be inserted into the rail, and the rail into the existing mounting holes on the frame. This would allow the yoke arm and the yoke extension to be easily repositioned along the long axis of the frame providing additional flexibility and reducing setup time should the operator require more than one weapon system.

#### **MARITIME CONSIDERATIONS;**

1. One of the most significant advantages in the use of the Spec-Rest™ for Maritime Operations (MAROPS) is the ability to maintain constant visual contact of suspected hostile forces at extended distances while supporting the entire weight of the firearm.
2. It is a fact that merchant vessels transmit an enormous amount of vibration along the hull, emitting from shaft alley and from within the engine compartment itself. This standardized weapons platform literally turned every firearm into a precision mounted weapon that could be engaged and disengaged from the rest instantly. This reviewer concludes that the Spec-Rest™ is a force multiplier as well as a weapon optimization platform that clearly brings instrument quality stabilization to the battlefield.

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3. The merchant vessel in use at the time of evaluation of the Spec-Rest™ was a Roll-On/Roll-Off (RORO) vehicle carrier capable of carrying 5,066 vehicles. The overall length of this SUEZ rated RORO is 199.94 meters, with a breadth of 32.20 meters, freeboard of 15.32 meters, and a gross tonnage of 57,449 tons.
4. The preferred shooting positions chosen during deployment are often located directly over the shaft alley. In this case, we found that our preferred positions would place us directly over frames 5 through 40. Tremendous vibration occurs at these locations but attenuates the further forward one travels on the vessel until little to no vibration is experienced at the bow of the ship.
5. In order to provide the reader with some sort of idea as to how vibration transmitted from a surface up through a medium and into a magnified optical lens can affect a shooter's ability to engage a hostile target, imagine trying to thread the eye of a needle while resting on a washing machine during an unbalanced spin cycle! In terms that one can measure using a typical MIL scale, it is quite common to experience vertical drift in the scope of more than 10 MILS at around 30 repetitions within 12 to 15 seconds. This is directly related to the operating RPM's of the engines and the rotation of the shafts.
6. So, if 1 MIL equals 3.62 inches at a 100 meters and the estimated range to target is approximately 350 meters, it becomes evident how difficult it can be to engage a point target no larger than 24 inches high by 15 inches wide (average torso/medium frame).
7. The Spec-Rest™ however, eliminated almost ALL of the vibration from the shafts and engines, making a selected engagement quite manageable out to distances of 500 meters.
8. In an effort to high-light the stability of the Spec-Rest™ to the greatest extent we took long-range photographs of nearby vessels through a mounted rifle scope using the ships railing as a platform and then using the Spec-Rest™ as the platform for the photography. It should be noted that the shooters were standing directly over the shaft alley where vibration on the vessel is most pronounced. This iteration employing the ships railing was unsuccessful, even after numerous attempts.
9. Following the failed experiment using the railing as the shooting platform, we placed the scoped weapon into the Spec-Rest™ HEAD and aligned it to the intended target which was a large merchant vessel over 1200 yards from our position. Clearly, a significant increase in stability of the reticule inside the scope was apparent. We were able to snap several pictures on the first attempt and did so with ease. Below are some of the photos taken while using the Spec-Rest™.

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**Fig 6.0: digital photo-vessel/1,200 YDS**



**Fig 6.1: digital photo-vessel/1,200 YDS**

10. Next, we conducted a series of drills in live fire testing our abilities to engage point targets beginning at the freeboard of the vessel (97 feet below), extending to distances beyond 500 meters.
11. Using the Spec-Rest™ with an M4 carbine with both an ACOG 4 Power scope, and an Eotech holographic sight, the shooter engaged the target of opportunity beginning along the side of the vessel from the standing ready position.
12. The shooter then transitions to the Spec-Rest™ at the stern of the vessel at an angle of 130 degrees and a beginning distance of over 100 feet, continuing to an angle of approximately 10 degrees, and a distance in excess of 500 meters.



**Fig 6.2: standing ready position**



**Fig 6.3: standing ready position**



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Fig 6.4: standing ready/Spec-Rest™

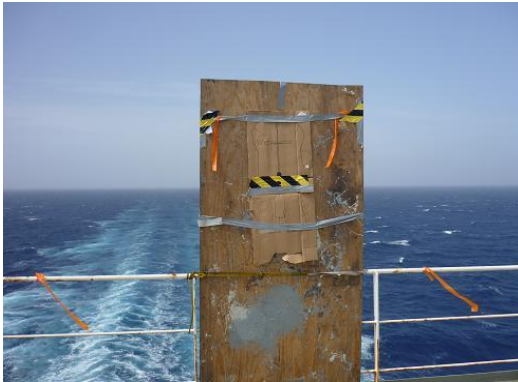


Fig 6.5: standing ready/Spec-Rest™

13. The shooter was able to maintain a shot group well within a 36-inch box of the floating target with at least 70 percent of all shots striking the target. The target itself was a moving object on both a vertical and horizontal axis of state, with no predictable pattern of movement except for anticipation of wave action as observed by the shooter. This drill was repeated by four different individuals who possess numerous years in both the U.S. military and law enforcement community. Of the 4 shooters who conducted the drills, 2 individuals are graduates of the USMC Scout Sniper School and USA Special Operations Target Interdiction Course, and have over 30 years combined experience in Maritime Interdiction and Advanced Urban Assault Operations. They are excellent marksmen and experts in rifle ballistics.
14. This is not to say that the probability of hit ratio was 100%, but using the Spec-Rest™ the hit ratio increased dramatically as well as placing missed shots well within 3 feet of the target. The target was a measured 26 inches by 36 inches (fabricated boxes) which were released along the side of the vessel and allowed to float freely to the point that the shooter could no longer observe the target with the aid of a 4 power optical scope. The Spec-Rest's™ ability to track and engage targets on rolling seas was a prove-out on Robert Black's design, known as **LS/VDT** (Live Screw/Variable Drag Technology).
15. Additional testing of the Spec-Rest™ for attenuation was conducted aboard the vessel using the .50 caliber bolt-action rifle. After verifying zero at 50 meters, we established a platform up high above the weather deck on the aft of the house of the vessel. We measured a distance of 140 meters to target and placed a drawing of a head close in scale to the average cranium onto the back-stop. With a pre-established Data of Previous Engagement (DOPE) of 600 yards applied to the rifle, one of the shooters verified the estimated hold-under at the prescribed distance to target.
16. After DOPE verification was established two separate individuals from the ship's crew were allowed to fire the weapon under our supervision. Using the Spec-Rest with a .50 caliber scoped special applications rifle and absolutely no training other than aid of a coach, both novice shooters were able to place a well-aimed shot on their first attempt into the designated kill zone of

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the paper target. The distance was 140 meters from an elevated platform on a vibrating surface while moving along moderately rolling seas (Sea State 3) just outside of the Gulf of Aden.



**Fig 6.6: BZO target SASR /50 meters**



**Fig 6.7: target SASR/140 meters**



**Fig 6.8: target SASR/140 meters**



**Fig 6.9: target SASR/140 meters**

17. The result of combining large caliber weapons with the Spec-Rest™ provided the shooter with unencumbered free range of motion as well as neutralizing the weight of the gun to achieve a near controlled “float” of all weapons tested, and was especially noticeable in the 50 Cal BMG. The attenuation of recoil on the 50 Cal BMG was astonishing, allowing the shooter to recover for visual confirmation and follow-on shots in rapid succession.

**CONCLUSIONS:**

In consideration of my experience in Maritime Interdiction Operations (MIO) since 1990 and both urban and rural sniper interdiction training and operations since 1986, I can confidently state that the Spec-Rest™ weapons mount system is a MISSION ESSENTIAL item for Ship Security. I would recommend it enthusiastically to any armed escort of skilled professionals assigned to protect both personnel and precious cargo from piratical attacks on the high seas.

The Spec-Rest™ absolutely exceeded this reviewer's initial expectations.

While this particular platform was originally designed for precision long-range hunting, it served equally as well in the MAROPS environment. With some minor military specific modifications applied to Mr. Black's design, the Spec-Rest™ kit would be well received by military forces in the field. Having conducted precision engagements from both vessel and helicopter borne platforms, I can fully appreciate the engineering prowess by Lone Star Field Products® design team and highly encourages everyone involved with anti-piracy missions to test the Spec-Rest™ under similar conditions.

Respectfully,

*Jimmy G. Thompson*

*CSM-LLC*