Rockwell VIPER:

PRECISION INTELLIGENT TARGETING SYSTEM FOR CONVENTIONAL MILITARY AND SPECIAL OPERATIONS FORCES

by Morris Peterson and Donald E. Davis-Ashbury International Group, Inc.

Rockwell Collins Inc., the worlds leader in military global positioning system (GPS) receivers is proud to introduce to the US Armed Forces, and MOU Countries, ***VIPER*** the worlds only design-built fully integrated, multi-purpose binocular laser range finder with a precision on-board digital magnetic compass and inclinometer. The ***VIPER*** is a true ***"Precision Intelligent Targeting System"***, providing conventional military and special operations forces (SOF) with a rugged, advanced technology targeting system that fully supports missions requiring surveillance, ranging, targeting and orientation. ***VIPER*** provides the highest probability of a first round strike, on the digital battlefield. Whether carrying out airborne, land, or maritime missions the ***VIPER*** can provide Warfighters with unfailing high quality performance in the field. All branches of the military share a common necessity for state-of-the-art, high quality e! ro-optic and GPS targeting equipmeni that can stand up to the rigors of current and future global military missions. The Rockwell ***VIPER*** is that device...and more!

PURPOSE BUILT ENGINEERING

As a binocular, the ***VIPER*** has no peer, and represents a new generation of high performance binoculars on the cutting edge of electro-optics technology. Its high quality optics has one of the highest light transmission values and sharpest fields of view in the industry. Two of ***VIPER***'s most advanced technical innovations-a state-of-the-art **totally** eye-safe Class 1-1.55μm diode laser range finder, and a digital magnetic compass with inclinometer have been incorporated into this ergonomically designed binocular. The ***VIPER*** is easy to operate, simply click the right button and display ranges to over 4km's with a total range accuracy of three meters! To obtain an azimuth, click the left button and the azimuth is displayed indicating a compass bearing of 0 to 360° with an accuracy of 10 mils (0.6°). Additionally inclination angles can be measured to ± 35° with an accuracy of 3 mils (0.2°). Distance, azimuth and elevation information is digitally displayed in the field of view by red LED's for a duration of four seconds. The VIPER can provide the user with a total of eight distance and angular measurements, all using just two buttons! A common 6-volt 2CR5 lithium battery powers the VIPER.

PRECISION INTELLIGENT TARGETING

Rockwell has integrated the ***VIPER*** binocular laser range finder with the PLGR+96/AN-PSN/11 (US DoD Precision Lightweight GPS Receiver), developing the first commercially off the shelf (COTS) precision intelligent targeting system. Warfighters, or traditionally trained fire support specialists, from any position on today's digital battlefield are now capable of bringing precision artillery, mortar fire and close air support on hostile positions with extreme accuracy (10 digit grid coordinate and CEP) at ranges out to 4 kilometers. ***VIPER*** provides precision in-direct fire support for the "close-in" infantry fire and maneuver, MOUT and Special Forces operations. The ***VIPER***

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targeting system is also night vision capable, employing the AN-PVS-14 monocular night vision device. The AN-PVS-14 is integrated to the ***VIPER*** by a rugged lightweight night vision interface. This effective combination of night vision and binocular laser range finder has proven to be effective for infantry forces engaging targets at night out to 2 kilometers! When engaging distant targets from OP's Warfighters have the option of employing a sturdy non-magnetic tactical tripod.

Forward Observers and Spotters with the ***VIPER*** can also now measure distances between various points relative to the target (e.g. natural terrain feature, opposing forces positions, and roadways). In a fire support role with the ***VIPER*** the FO can rapidly with a greater degree of precision "call in" and adjust mortar and artillery fire. He can also provide dimensional measurements of parachute drop zones, helicopter landing zones, to include heights of buildings, trees, etc. To protect the FO the ***VIPER*** can be provided with anti-reflective and laser protection filters.

RECONNAISSANCE AND SCOUTING

From concept, the ***VIPER*** was designed as a 3½-pound precision observation instrument. Warfighters benefit from the clear sharp images the ***VIPER*** provides, due to its precision; high quality multi coated optics. The ***VIPER*** has routinely outperformed various military binoculars in terms of light gathering capability under low light, and night conditions. Rugged and dependable, the ***VIPER*** has survived the rigors of long-range reconnaissance patrols in snowbound mountainous environments, and hot arid desert AO's. The ***VIPER*** aids Warfighters to prepare more accurate reconnaissance reports utilizing its highly accurate binocular laser range finder to provide range measurements, and target azimuths by a simple series of button presses. The ***VIPER*** can also be field programmed to display measurements in feet, yards, meters, mils, and or degrees.

SNIPING

The ***VIPER*** could be considered the ultimate military sniper support optic. It combines a number of precision devices into one user friendly instrument, that supports short, intermediate, and long-range sniper missions. The ***VIPER*** provides accurate distance to target information at over 2,000 meters (maximum sniper rifle range), eliminating the most frequent cause of missed sniper shots, errors in judging distance. Range estimation is critical for all snipers, but most especially for SOF snipers that must be capable of delivering a guaranteed neutralizing shot at 600 yards. The ***VIPER*** also displays the angle of engagement when indexing targets up or downhill (plunging fire) to $\pm 35^{o}$. This is critical when snipers engage targets at extreme angles (i.e. high atop multi-story buildings) and over extended ranges. ***VIPER*** comes standard with both an electronic and a "hard" SWISS Mil reticle. This combination provides increased accuracy in placement of the laser, and in the event battery power is lost, range finding can still be performed with the mil reticle. For situations when the target was partially obscured (trees, vegetation, structures, etc.), ***VIPER*** features, **Multiple-Object-**

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Measurement or **MOM**. Instead of following the road many manufactures have taken, where incremental and intermediate ranges are "dialed out" through a process called "gating". **MOM** allows the sniper to view up to the three strongest pulse returns from targets in the line of sight, by simply scrolling through them using the range finder button. This state-of-the-art function was introduced to the sniper community through close collaboration between engineers and international sniping authorities. One of the inherent benefits of the ***VIPER's*** 1.55μm eye safe laser diode technology is the ability to "laze" targets from behind different types of glass, allowing the sniper to remain secreted in his OP.

LAND NAVIGATION

Land navigation is an essential military skill. Recognizing this, built into every ***VIPER*** is a highly accurate Digital Magnetic Compass (DMC). The DMC is so highly regarded it was selected as the electronic compass of choice by the US Army for a military range finder project. The exacting DMC can also be adjusted ± 90° for declination allowing for its use worldwide. To factor out various types of magnetic interference ***VIPER*** uses a simple compensation process that takes less than a minute to perform. Upon completion the ***VIPER*** tells the Warfighter whether the unit is properly calibrated. The ***VIPER*** also assists Warfighters to accurately locate their positions when reading maps, by providing azimuths and **absolute** distances to significant terrain features. With the **relative** measurement features in the ***VIPER*** software, Warfighters can now measure distances between significant terrain features, determine the relative height differences between the features, and when necessary measure the height of each terrain feature individually!

CREW SERVED AND ANTI-ARMOR WEAPON SUPPORT

Due to the range of "heavy" weapon systems available to the Warfighters, the ***VIPER*** can enhance the effectiveness of crew served weapons. Traditional methods of "walking" rounds into a target tends to waste ammunition, increase collateral damage and alerts opposing forces of incoming fire. By employing the ***VIPER***, the crew can "laze" the target, and the weapons operator can adjust the sights for the exact range prior to firing, and when ready, **deliver precise effective fire**. Crew served weapons that are supported include:

- M-60 LMG - M240 - FN/MAG - GPMG - H&K 21E
- M2 .50 Caliber Heavy Machine-gun
- Mk-19 40mm Automatic Grenade Launcher

In an anti-armor weapon support role, the ***VIPER*** can assure the precision placement of shoulder fired ordnance on target. Whether the target is moving or stationary, the ***VIPER*** provide the Warfighter accurate ranges on a wide variety of target types.

AMPHIBIOUS OPERATIONS

Whether conducting small boat, or combatant/scout swimmer operations,

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the ***VIPER*** can support amphibious Warfighters in a waterborne environment. The standard ***VIPER*** is waterproof to a depth of 3 feet and can be optionally waterproofed to a depth of 1 atmosphere for sub-surface operations. The durable shock absorbing rubber cover, sealed over the strong die cast housing helps to insure that the ***VIPER*** performs in harsh and demanding amphibious environments. If the ***VIPER*** is accidentally dropped overboard during an operation, don't worry because it floats!

MAPPING AND INTELLIGENCE GATHERING

The newest role for the ***VIPER*** in the military community is real-time mapping, and recording of geographical information. This unique application for the ***VIPER*** casts it in the role of a field data collector, connected to a ruggedized field computer with specialized GIS software. ***VIPER*** in this configuration provides intelligence personnel the ability to produce real-time maps combined with highly accurate GPS coordinates. ***VIPER*** in this role lends itself to many SOF special surveillance and pre-assault building analysis missions.

FORCE PROTECTION, SECURITY AND THREAT SURVEYS

Warfighters are many times called upon to conduct force protection missions, OOTW security and threat surveys on sensitive installations, embassies, airports and other strategic facilities. Cast in an unconventional, but fitting role the ***VIPER*** is the perfect data collector. By utilizing both **absolute** and **relative** measurement functions, the ***VIPER*** can assist the SOF operator in the preparation of accurate site diagrams, perimeters, defensive fighting positions, exact threat vantage points, CCTV camera views, etc. Until now no such multi-purpose tool existed, and the Warfighter spent many man hours walking the site with a tape measurer, relying on out of date or inaccurate maps or blueprints, or in some cases even guesstimating. This no longer need occur as the ***VIPER*** can support the survey process either as a stand alone instrument, or as part of a GIS mapping system where the entire survey is recorded electronically with digital photographs, and real time notations.

CONCLUSION

As an "Precision Intelligent Targeting System" the ***Rockwell VIPER*** represents the latest advancement in electro-optic technology and combat GPS systems integration. Rockwell's approach to the DoD community is user driven, mission capable and available commercially-off-the-shelf to assist Warfighters TODAY.

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