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LRC System Allows Remote Disposal

Frederick L. Barthold

Panther Ridge Research, Inc.

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Remote Disposal

Panther Ridge Research initially designed a Laser Receiver Controller system for the blasting industry where non-electric shock tubing could be used as the lead for initiating the blast-hole pattern of the material to be blasted (known as the overburden). Presently, the system is being modified for the explosive ordnance disposal and unexploded ordnance technician. This tool was designed “by a tech for a tech,” and it is anticipated it will save operators many grueling hours of setting up the disposal sites as well as cleanup after operations are completed.

By Frederick L. “Bart” Barthold, Panther Ridge Research, Inc.

Panther Ridge Research’s Laser Receiver Controller system eliminates the lead-in line from the area to the disposal site(s) by using a pulse-coded laser light to close the distance and initiate the disposal event. The system is safe, inexpensive, efficient and easy to use, and it readily accepts existing disposal devices currently used during disposal operations. This unit provides a low-voltage circuit to initiate electric detonators, squibs and energetic materials (such as thermite devices) and also provides a high-voltage circuit sufficient to initiate a non-electric shock tube. A continuous check circuit and safety arming circuit are built into the LRC, which permits the user to check the entire circuit before leaving the disposal site. An inherent safety ratio of 3-to-1 is designed into the circuitry.

Description

The LRC System is comprised of the following components: the laser transmitter, the laser receiver and the laser receiver controller. The system is designed to be a man-portable in the safe area and the disposal site(s), within minutes. The operator simply needs to follow these steps:

1. Place the laser transmitter on one tripod at the designated safe site, traverse to the disposal site, and set up the remaining tripod and laser receiver.
2. Connect either the electrical firing lead or the non-electric shock tube lead to the disposal pattern (may be single or multiple shots).
3. Select the mode of operation and follow the program selections of the receiver controller for the specific site. Alignment takes less than a minute.
4. The last man out starts the timer and departs to the safe area.
5. Once at the safe area, the operator views the receiver controller through the mounted telescope, and depresses the trigger to initiate the firing circuit.

Assessment

A Class 1 (eye-safe) laser is used throughout surveying circles and utilities industry with great and dependable accuracy, and has been proven in rugged conditions for many years. This same Class 1 laser light source is used to activate the receiver controller circuit from over 1 mile. The receiver controller (see Figure 2) has been designed to complement the laser and reduce the setup and cleanup time of the disposal operations in the field, and it has achieved remarkable reliability during testing. Thermite devices, electric detonators and non-electric shock tubing are readily connected to the LRC firing lead for ease of set up and function.

The EOD profession must provide technicians with up-to-date, easy-to-use, dependable tools and have safety foremost in mind. UXO companies that want to be successful competitors in this industry must consider the cost of equipment. The LRC system is lightweight, which equates to less gear needed in the field and less stress on the operator(s) who must carry the gear while traversing rugged terrain. The LRC system will help lower operating costs for communities by reducing man-hours during initial setup as well as break-down of the operations—less time on site, less time in the field, and the system is reusable.

Future Development

In the future, should the operator desire a status check of the system, it will be possible to communicate with the receiver controller from the safe area. The system could easily be connected to a non-lethal deterrent device, which could be used as a perimeter guard for force-protection units. Also, command control may be obtained by using one laser transmitter to initiate multiple LRC units set at strategic locations. This multiple system may be used presently in the field where there are multiple disposal sites over a very large area. In the immediate future, both the laser transmitter and the laser receiver will have global positioning systems mounted within each unit. A 360-degree laser-alignment capability is currently under development, which will eliminate the line-of-sight requirement. At present, the aiming time and remain-armed time can be extended to weeks, months or longer. This feature may be of particular interest to specialized groups. In addition, a self-destruct feature may be incorporated.

See “References and Endnotes,” page 108

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Figure 1: The entire Laser Receiver System is viewed with the tripods.

Figure 2: The Laser Receiver Controller is in view with the tripod.

Figure 3: The close-up of the black unit is the Laser Transmitter.

Panther Ridge Research’s President is Frederick L. “Bart” Barthold, a retired Navy master chief and master EOD technician who worked in the demolition, ordnance disposal arena for over 24 years, providing technical expertise in the engineering, testing, modifications, and acceptance of pyrotechnics, demolition materials and auxiliary equipment for special groups.

Frederick L. “Bart” Barthold
President
Panther Ridge Research, Inc.
1601 Bluegrass Rd.
Solsberry, IN 47459 / USA
Tel: +1 812 825-2390
Fax: +1 812 825-4590
E-mail: bart@pantherridge.com
Geneva Diary: Report From the GICHD, Mansfield [from page 82]

Endnotes

2. One square metre is approximately equivalent to 1.2 square yards.

Mine Action Support Group Update, October 2005 MASG Newsletter [from page 85]

Endnotes

2. Editor’s Note: Some countries and mine action organizations are using the term “mine free,” while others are espousing the terms “mine safe” or “impact free.” “Mine free” connotes a condition where all landmines have been cleared, whereas the terms “mine safe” and “impact free” refer to the condition in which landmines no longer pose a credible threat to a community or country.

LEC System Allows Remote Disposal, Barfield [from page 89]

Endnotes
1. Tracer pending.

How Deminer Position Contributes to Injury, Jetté, Dianne, Maach, Makris, Ceh and Bergeron [from page 93]

Endnotes


6. 10 centimeters equals approximately 4 inches.

7. Fractional land used that has been pulverized by explosives forces, with silica dust as the main by-product of this process.

8. SAE E231 refers to the SAE Recommended Practice E231, Instrumentation for Impact Tests (MAR95). It provides standards for the performance of equipment in impact tests.


13. 1 g = 9.8 m/s2.

QR Hit a Homerun: Landmine-Detection Systems Based on Quadrupole Resonance Technology Show Progress, Turner and Williams [from page 95]

Endnotes


Rats to the Rescue: Results of the First Tests on a Real Minefield, Verhagen, F. Weetjens, Turner and Williams [from page 106]

Endnotes

2. The Tuberculosis Project is a study hoping to change the way Tuberculosis is diagnosed using the exceptional sniffing abilities of rats. For more information, please see http://www.nbc.co.uk/1/hi/health/5348599.stm. Accessed 11 Nov. 2005.

Blast Protection For UXO Operations Including Demining, Miles [from page 103]

Endnotes


3. In collaboration with DNVC Ltd. in the United Kingdom.


From
The editorial staff of the Journal goes to great effort to make sure that what is printed in our magazine is accurate, properly documented and unbiased. However, in Issue 9.1 there were two errors for which we feel we must apologize. In the sidebar entitled “In Brief,” we erroneously mentioned something that was mentioned in an earlier article by Patrick Doherty (http://www.mineaction.org/masg2004/issue9.1/issue9.1_10.pdf). We hereby apologize for this accidental error, and thank Mr. Doherty for calling it to our attention. We sincerely apologize to the author, “Mine Action in Yemen: An Example of Success” (pages 18–19, 17), to Manook Al-Aziz. It was actually written by Faris Mohammad, UNDP Mine Action Specialist for the Yemen Mine Action Programme. We apologize to Faris Mohammad for this error and thank him for bringing this to our attention.

If you have found an error in the Journal of Mine Action or disagree with anything we have published, please send your comments to “Letters to the Editors” at mailto:Letters2005@mineaction.org.