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LRC System Allows Remote Disposal

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LRC System Allows Remote Disposal

Panther Ridge Research initially designed a Laser Receiver Controller system¹ 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 safe 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 material (such as thermite devices) and also provides a high-voltage circuit sufficient to initiate a non-electric shock tube. A continuity check circuit and safety arming circuit are built into the LRC, which permit 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 disposal tool for EOD and UXO technicians. The entire system weighs less than 30 pounds and is carried in a backpack. It may be used in two modes—on-site and remote. The on-site mode operates similar to a standard “Hell Box” or blasting machine and is to be used for distances of 1,500 feet or less from the ordnance or the designated target sites. The remote mode requires use of the laser portion of the system and will require line of sight between the

Physical characteristics of LRC system.

Receiver controller		Laser	
Size:	4”L x 11.5”W x 7”H	Size:	5.25”L X 4.0”W X 1.75”H
Weight:	7.0 lbs.	Weight:	< 3.0 lbs each
Range:	1,500+ feet	Range:	5,280+ feet
Operating Temperature:	-22 F to +140 F	Battery:	9 VDC
Storage Temperature:	-40 F to +176 F	Color:	Black
Humidity:	90% non-condensing		
Environment:	Water- and dust-resistant	Tripods	
Display:	CD, 4-Line Xx20 characters	Size:	27” H with an 18” base to 74” H with a 43” base
Keypad:	Membrane keypad	Weight :	6.0 lbs each
Battery:	12 VDC		
Color:	Yellow, black, orange		

laser ranger and the laser receiver, which for operator convenience may be extended to a distance of one mile (see Figure 1).

Operation

The system can be set up and ready to use, at both 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



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



Figure 2: The Laser Receiver Controller is the yellow box and panel.

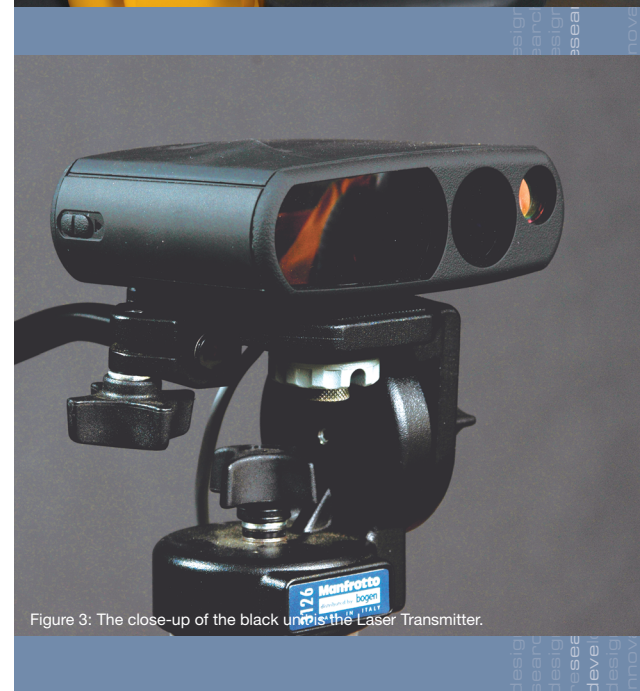


Figure 3: The close-up of the black unit is the Laser Transmitter.

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 arming 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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Frederick L. “Bart” Barthold is president of Panther Ridge Research, Inc., a company dedicated to the UXO disposal arena and blasting industry. He is a retired Navy master chief and master EOD technician who has worked in the explosive arena for over 34 years, providing technical expertise in the engineering, testing, production, and acceptance of pyrotechnics, demolition materials and ancillary equipment for special groups.

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Endnote

1. Patent pending.

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