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ESR-EOD-1701
BOMB DISPOSAL ROBOT
SYSTEMS

MAdoorS EOD Robots

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PURPOSE, TECHNICAL CHARACTERISTICS AND DESCRIPTION

The electrically powered remote controlled EOD robotic vehicle is constructed and proposed for anti terrorism activities such as:

- Removal of explosive devices from public areas
- Removal and destruction of various unattended packages and or baggage at airport terminals, movie theaters and others similar locations
- Removal of chemical and other aggressive compounds/substances
- Removal of poisonous compounds/substances
- Removal of radioactive compounds/substances

The **Madoors ESR-EOD-1701** EOD Robot is constructed of quality 3mm thick steel plating and is powered by two independent drive electro motors with chain transmissions to three wheels on each side. The power source consists of two ecologically acceptable “Optima” gel batteries with a capacity of 100 As, that can be augmented during usage with a petrol powered electro generator that can be easily

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The 6 wheel-propelled **ESR-EOD-1701** EOD Robot is specially designed for removal of materials hazardous and dangerous to people and property. The working principle is based on two **grippers**, providing highly reliable EOD/IOD mine clearance.Themachine is remotely controlled from an armored vehicle or from a safe distance. It is operational within a temperature range of –55 to +40o

ESR-EOD-1701 consists of the following components:

1. **CHASSIS**
2. **Manipulator (arm – gripper) (optionally)**
3. **Control Console**
4. **Generator**
5. **Video System**
6. **Water Dısrupter (Ak-er)**
7. **Weapon camera, Weapon holder and Electro-mechanical firing trigger system (optionally)**

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1) The **CHASSIS** (Picture 3) is an independent construction made from welded steel plating and containing the engine, the controller, power sources (batteries), manipulator base and forward gripper (P1).

The drive and control functions are made through two independent electro motors that transfer their power via chains and chain pulleys (V1) separately to the left side and right side wheels.

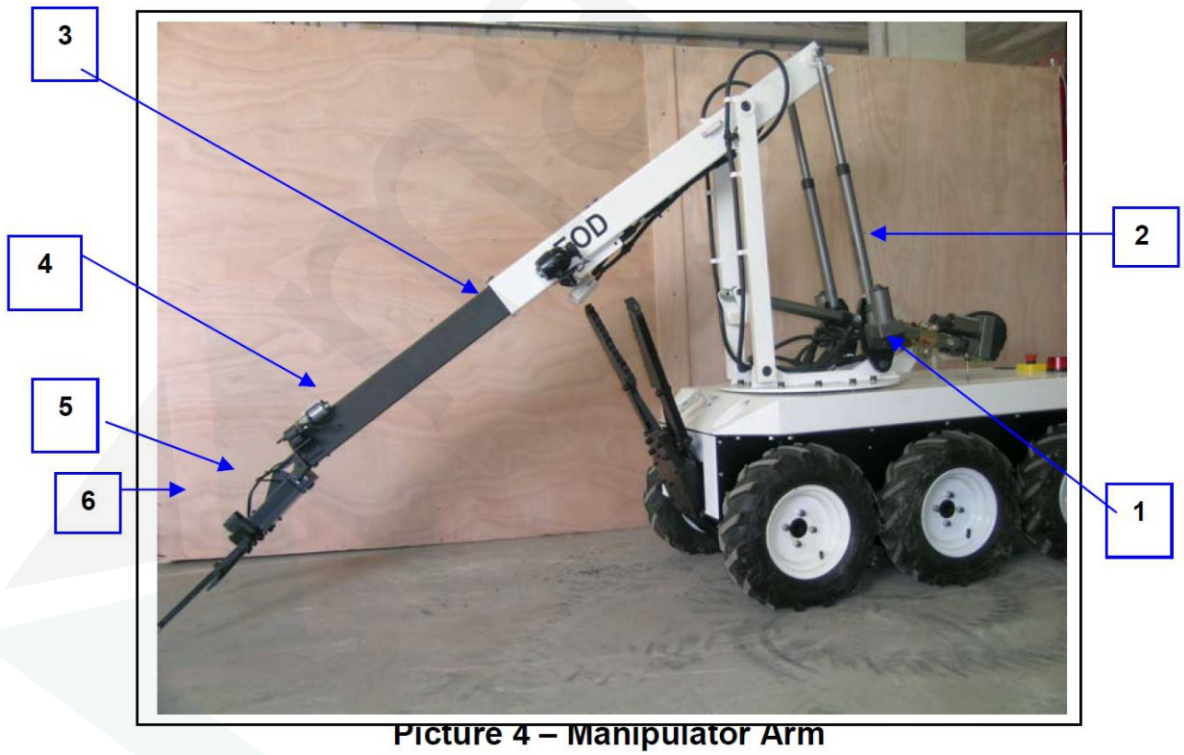
Energy from the batteries is controllably directed to the electro motors via the controller (processor box) (C1) to drive the vehicle. Processors in the processor box protect the regulating electronics from overloads and control the movement of the manipulator and arm grippers during the machine's driving.

Picture 3 – Chassis

2) The **MANIPULATOR** (Picture 4) arm is used for executing various operational tasks including snatching and transporting dangerous materials and UXO/EOD/IOD.

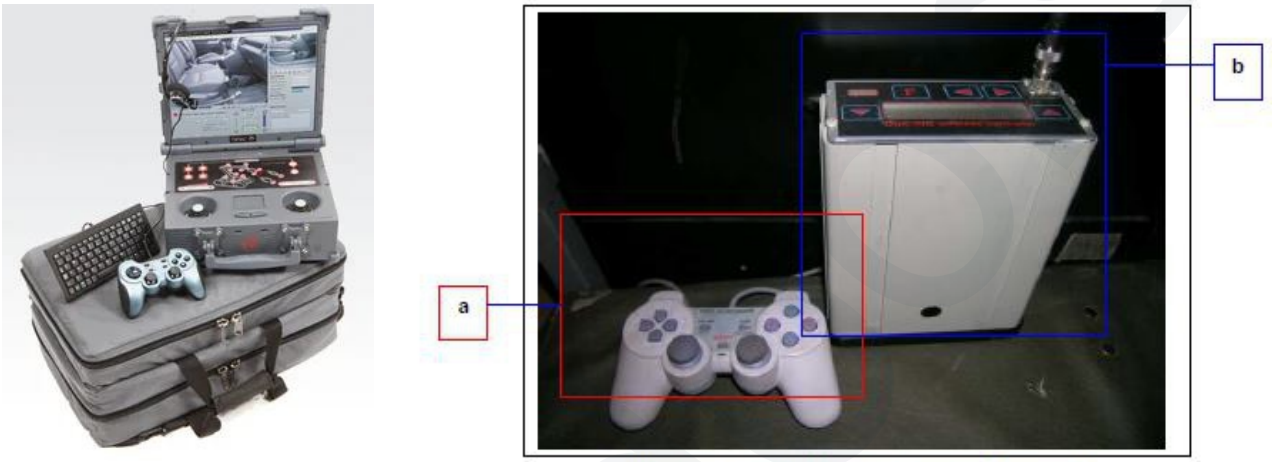
It consists of:

1. The base (1), which is used for the gripper's horizontal rotation around the vehicle's vertical axis.
2. Shoulders (2) that fasten the manipulator arm extension and enable vertical movement / bending.
3. The extension (3) allowing extension/lengthening of the manipulator arm by 460 mm there by allowing greater reach.
4. The rotation (4) of the gripper enables the increase of operational and manipulative capacities of the latter.
5. The joint (5) of the gripper allows for grasping items at an angle.
6. The gripper (6) is used to grasp/snatch items.



Picture 4 – Manipulator Arm

3) The **CONTROL CONSOLE** (Picture 5) is used to operate the EOD Robot and consists of two major parts: **a) Portable Console** *and* **b) Control Unit.**



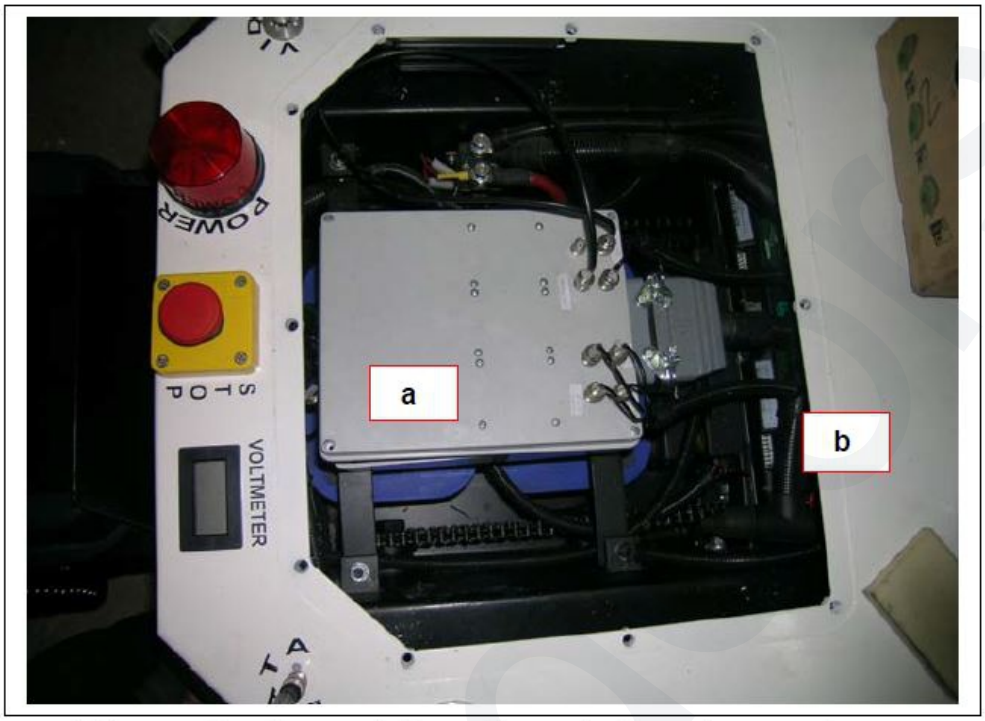
Picture 5 – EOD Robot Control Console

Picture 5 – EOD Robot Control Console

The Control Console of the EOD Robot is fastened with a belt around the waist of the operator so as not to interfere with work.

Regulating electronics

The assembly of regulating electronics is positioned in the rear of vehicle and consists of a Processor Box (Picture 6a) and Control Console (Picture 6b). It consists of 3 processors required for operation and control of the machine. It performs 10 H-bridge and 12 ON/OFF functions.



Picture 6 – Assemblies of regulating electronics
a – Processor Box
b – Control Console

Control Console

The Control Console is used to operate the machine and consists of a Portable Console and Control Unit. It has an LCD screen (Picture 7), which displays the machine's current status and functions performed. Operation of the ESR-EOD-1701 EOD Robot is controlled by two synchronized integrated processors that can halt all performed functions in order to prevent damage to the assemblies. Inside the box is a transmitter with variable power output, receiver for feedback information and battery. A self-testing system warns the machine operator about possible malfunctions by means of tone signal.

Picture 7 – Screen of Control Console

Portable console

Remote control of the ESR-EOD-1701 EOD Robot is accomplished by using the Portable Console . Ergonomic design and light weight enable ease of use. It is made of ABS plastic - durable and shock resistant material. The Portable Console is not waterproof. It must be kept away from rain and other water influence.

For reading status of the buttons and sticks there is a processor built into the joystick. The same processor monitors communications between the Control console and the joystick itself. The communication between them is serial and bi-directional. The control console reads the data coming from the joystick with an approximate frequency of 10000 times per sec., which ensures a quick response and reduction of the possibility of incorrect information (in case of any external interference or EMI, that could influence the accuracy of data new information arrives within a period of 10 us). The portable console has been tested in the most severe working conditions and to-date, no serious problems have appeared.