

## Teleoperated Ordnance Disposal System (TODS)

The TODS is an unmanned multipurpose utility vehicle particularly suited for operations in hazardous and hostile environments. Originally designed for ordnance disposal, its unique features make it applicable to a wide variety of applications where minimizing human exposure is paramount. The TODS consists of a commercial-off-the-shelf skid loader outfitted for teleoperated remote control (RC), and modified with a modular tooling interface to accept a variety of actuators.



**Detection & Excavation**



**Object Manipulation**

enables mine



**Minefield Clearance**



**Vegetation Clearance**

**OPERATIONS.** The equipment is deployed from a control site established a safe distance from the operations area, which can be up to 3,000 ft (1000 meters). Extended range options are available. All functions, including access to the operations area, are performed under teleoperation, with real-time monitoring and command execution performed via user-friendly operator interface.

**VERSATILITY.** Depending on the tooling applied, the TODS is applicable to a variety of remote operations: heavy object manipulation (lifting, moving, breaching); sensing and surveillance; landmine remediation (site preparation, detection, tagging, excavation, clearance); UXO/IED investigation and countermeasures; crowd control and dispersal; equipment towing; remote sensor placement; and similar operations. A GPS option further enhances operations capabilities, coordination with other mission assets, and mapping and tagging operations. The gripper assembly enables remote handling of suspect objects. The flail attachment enables AP mine clearance and proofing operations. Vegetation cutter and boom mower tools enable site preparation and enhance detection and tagging operations. The TODS can accommodate multiple detectors (e.g., magnetometers, x-ray, GPR). The compressed air excavation system exposes UXO non-intrusively. The backhoe/ bucket tool excavation.

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# Teleoperated Ordnance Disposal System (TODS)

## General Performance Characteristics

- **Power Source** ..... 30 HP diesel engine
- **Operating Time** ..... Approximately 10 hours. Two hours battery operated with engine off (in surveillance mode) with platform & platform-mounted components
- **Drive System** ..... Skid Steer independent wheels, solid tires
- **Carriage** ..... Width 60", Length 120"
- **Speed** ..... Proportional 0 to 5 miles/hour
- **Climbing Ability** ..... Up to a 30° incline
- **Side Tilt** ..... 20° maximum
- **Maneuverability** ..... High maneuverability in sand, rocky terrain, muddy soil, etc. Turn radius equi
- **Towing Capacity** ..... 2,500 lbs.
- **Weight Fully Implemented** ..... 4,000 lbs.
- **Remote Control** ..... RF data control & video/audio monitor or hardwire cable

### Remote Control Characteristics

- **Data Control System**
  - **Radio Link** ..... Data control to robot & video /audio monitor return. Coverage Frequency Dependent.
  - **Wire Link** ..... up to 3000 ft. (fiber optics and extended range, optional)
- **Major Controls** ..... Joystick analog data channels (two) for platform drive control (speed & direction)
  - Hydraulic pressure selector (Arm speed analog control)
  - Up to 48 on/off remote outputs (digital data)
- **Control Box** ..... Weatherized portable suitcase
- **Data** ..... Microprocessor coded FSK information

### Manipulator System

- **Arm** ..... Two sections & gripper, each with independent motion control
- **Reach** ..... 8 feet horizontally
- **Lifting Capacity** ..... 150 lb-arm not extended  
..... 200 lb-arm fully extended
- **Gripper Opening** ..... 10 inches

### Power Options

- **Gasoline engine or electric motor drive**

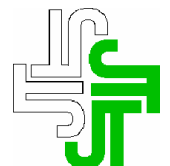
### Optional Tooling

- **Rotary Vegetation Cutter**
- **Boom Mower Tool (to cut detection lanes)**
- **Paint Marking Tool (tagging)**
- **Chain Flail (for clearance and to proof cleared areas)**
- **Specialty Sensors (customer specify)**
- **GPS capability (real time, 2 cm accuracy)**
- **Winch**
- **Compass**
- **Blast Panels**

### Video System

- **Video Camera 1** ..... Driving Camera (color)
  - Pan and Tilt
  - Auto Focus
  - Auto Zoom
- **Video Camera 2** ..... Tooling Camera (color) (fixed on tooling arm)
  - Auto and manual Focus
  - Auto and manual zoom
- **Monitor** ..... Color, NTSC, portable (12 VDC/110VAC standard)

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*Specifications Subject to Change Without Notice*