

## Warranty and Service

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### Warranty

The Manufacturer's Warranty documentation is enclosed with all new product shipments and is available online at:

<http://www.reconrobotics.com/warranty>

### Manual Translations

This manual is available in several languages online at:

[http://www.reconrobotics.com/service/recon-scout\\_user\\_manuals.cfm](http://www.reconrobotics.com/service/recon-scout_user_manuals.cfm)

### To Request Service or Repairs

Call or e-mail your ReconRobotics representative or reseller to describe the problem you are experiencing and request a Return Material Authorization (RMA) tracking number. In addition to your original sales receipt, you will need to provide the unit's serial number, your return shipping address, email address and a daytime telephone number.



ReconRobotics, Inc.  
7620 West 78th Street  
Edina, MN 55439 USA  
1-866-697-6267 or 952-935-5515  
[support@reconrobotics.com](mailto:support@reconrobotics.com)



KNOW BEFORE YOU GO®



## Throwbot XT User Manual

Version 1.08 June 2012



R001108

## Product Identification

This manual applies to the ReconRobotics Throwbot® XT and OCUs.

### Notice:

Changes or modifications not expressly approved by ReconRobotics could void the user's warranty and could void the user's authority to operate the equipment.

All materials contained in this document are proprietary and confidential.

Reproduction and duplication, without specific written permission, are strictly prohibited.



### Corporate Headquarters:

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Place Serial Number Sticker Here

**The devices described within this manual are protected under US Patent Numbers 6,548,982, 6,806,346, 7,559,385 and other patents pending.**

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- Lithium Polymer batteries are volatile. Only charge the robot and OCU with chargers provided by ReconRobotics. Failure to do so may cause fire, which could result in personal injury and/or property damage.
- By purchasing the Throwbot XT robot kit, the buyer assumes all risks associated with lithium polymer batteries. If you do not agree with these conditions, please return the robot kit to ReconRobotics.
- Do not attempt to disassemble or modify the robot or OCU. This may cause an electric shock, fire or system failure.
- Do not insert any foreign objects inside the robot or OCU. This may cause electric shock, fire or system failure.
- Do not immerse the OCU or chargers into water or liquids.
  - If water or any liquid enters the inside of the OCU, immediately stop use to avoid electric shock, fire or system failure.
- The following describes additional symptoms of a device that needs technical attention and should not be used:
  - After a full charge, the OCU display intermittently turns ON and OFF.
  - The OCU or charger has been dropped and is malfunctioning.
  - There are exposed wires on a charger cable.
  - The robot, OCU or charger becomes too hot to touch.
  - There is an unusual sound emitted from any of the components.
  - There is smoke emitted from any of the components.
  - There is a burning smell emitted from any of the components.



**If you have questions or concerns regarding the use or operation of the robot or OCU, discontinue use and contact ReconRobotics or the vendor from whom you purchased your equipment.**

## Safety Information & Warnings

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**Read these warnings before charging or using your Throwbot XT robot or OCU. Failure to read and follow these instructions may result in fire, personal injury and/or damage to property.**

- To reduce the risk of electric shock, do not remove the shell of the robot, Operator Control Unit (OCU) or the chargers. No user-serviceable parts are inside. Refer servicing to qualified ReconRobotics service personnel.
- To reduce the risk of injury or damage, keep these safety precautions in mind when setting up, using and maintaining your equipment.
- Read all safety and operating instructions before operating the robot or OCU.
- Retain the safety and operating instructions for future reference.
- Follow all operating and usage instructions.
- Do not attempt to service the robot or OCU yourself. Repairs or modifications not conducted by authorized personnel will result in the voiding of warranty and/or Annual Maintenance Plans.
- Keep loose clothing and hair away from the robot.
- Considerations for charging:
  - Always charge the robot with the activation pin inserted.
  - Always keep the OCU turned off while charging.
  - Always charge in a cool, ventilated, fire-safe area.
  - Do not leave system unattended while charging.
  - Always use a proper country-specific AC socket (120-240 VAC) with the AC Dual DC Battery Charger. Do not force the plug into a socket.
  - Ensure the charger plug is inserted at the correct angle when connecting to the robot or OCU.
  - Ensure the barrel of the charging connector is not deformed, bent or otherwise damaged before inserting in the robot or OCU.

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Note

**For applicable FCC guidelines, refer to your FCC logbook (US customers only).**

## Throwbot XT Kit Inventory

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Please inspect the contents of this package to ensure that all materials are present.

If any of the materials are missing, please contact [support@reconrobotics.com](mailto:support@reconrobotics.com).

### Your Throwbot XT Kit includes:

- One (1) Throwbot XT or Throwbot XT Audio Robot
- One (1) Operator Control Unit (OCU) with lanyard
- One (1) Throwbot XT & XT Audio 4-Pin AC Dual DC Battery Charger
- One (1) Region-Specific AC Power Cable
- One (1) Spare Activation Pin
- One (1) Tether Kit
- One (1) Pelican® Carrying Case
- One (1) User Manual

### Double Throwbot XT Kits include:

- One (1) Additional Throwbot XT or Throwbot XT Audio Robot
- One (1) Additional Activation Pin

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## How do I request service if I am still experiencing problems with my ReconRobotics equipment?

You can request service by contacting your ReconRobotics sales representative (refer to page 17). When you contact, please have the following information available:

1. Problem description
2. Customer agency
3. Contact name
4. Contact phone or email
5. Serial number of the product that is experiencing difficulties

Our technical staff will attempt to troubleshoot and resolve the problem. If repair service is needed, we will set up an RMA (Return Material Authorization) and arrange for shipment of your equipment to our US repair facility. Standard turnaround time for repair is under one week after receipt.

If your issue cannot be resolved remotely, ReconRobotics will provide loaner equipment for Throwbot XT kits during the repair process. We pay all shipping costs.

If your issue is not covered under warranty or by an extended service plan, we will provide a not-to-exceed (NTE) repair cost estimate for your approval before commencing repair. After repairs are complete, you will be invoiced for the actual cost of repairs up to this estimate.

When sending equipment in for RMA, please include the entire kit (Robot, OCU and chargers) to ensure all necessary repairs can be completed.

## Troubleshooting (cont.)

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**When I throw the robot, it does not drive straight when it lands. What could be wrong?**

The robot has electronic circuitry that needs to self-calibrate after a throw. When the robot lands, let it sit still for a few seconds before driving. It will automatically recalibrate itself during this time and should resume driving as expected.

**Why isn't the robot's IR light turning on?**

The IR LED will not turn on if the light sensor detects sufficient light, in order to conserve battery life. If your robot's IR light does not turn on when the robot is in a state of complete darkness, there may be an issue with the light sensor.

**What would cause the IR light to stay on constantly, even in daylight?**

If there is dust or debris present on the IR blister, the light sensor may determine the environment has less ambient light than it really does. Ensure that the IR blister is free of dust or debris by wiping it with a soft towel.

**The robot or OCU doesn't seem to be holding a full battery charge. What can be done?**

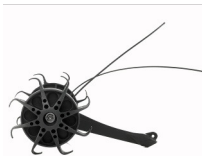










If you feel that your Throwbot XT robot or OCU is not running for its complete battery life on a full charge, there is a simple self-diagnosis test you can run to check the performance:

- Fully charge your robot and OCU (refer to page 7 for instructions). Start test by pulling pin from robot and turning on the OCU. Record the time that the units are turned on. Run both units continuously until:
  - a. Robot stops moving and sending video
  - b. OCU screen goes blank and stops sending commands.
- Record the time. Contact ReconRobotics for service if:
  - a. Robot runs for under 60 minutes
  - b. OCU runs for under 120 minutes

## Throwbot XT Robot Components

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A robot should have the following components:

	Throwbot XT	Throwbot XT Audio
<b>Two Antennas</b>		
<b>Activation Pin</b>		
<b>Two Wheels</b>		
<b>Stabilizer Tail</b>		
<b>IR Blister</b>		
<b>Water Resistance</b>	Passively water resistant to a depth of one foot (30cm) for five minutes	Passively water resistant to a depth of one foot (30cm) for five minutes
<b>Microphone</b>	Not Active	

If any of these items are missing or damaged, please notify ReconRobotics immediately. (See Warranty and Repair, pg. 17)

## OCU Components

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An OCU should have...

	OCU II
Two Antennas	
Lanyard	
Power Switch	
Headphone Jack*	
Audio/Video Out Jack*	
Charging Port	

\*Audio reception is only available with audio-enabled robots (Throwbot XT Audio), and A/V out signal is only available with A/V cabling package.

## Troubleshooting

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**I've been using the OCU for an extended period of time. Now the screen is black when I power on, and I cannot control the robot. What could be wrong?**

For safety purposes, when the battery drops below a certain voltage, the OCU deactivates itself. You will need to recharge the OCU as described in the "Instructions for Use: Chargers" section (page 7).

**I've turned the OCU on, and the screen is not displaying a solid video stream. What could be wrong?**

"Bad" video can have several possible causes:

- The robot may be out of range.
- The robot may be low on power or deactivated.
- The robot or OCU may be experiencing interference caused by environmental factors (e.g. other radio devices in the area or proximity to metal).

**The charge indicator lights do not light up when the robot or OCU is connected to the battery charger.**

Refer to page 7 for instructions on how to read the indicator lights on your chargers. If you are still having issues, test for:

- Faulty power to the charger. Try powering the charger from another source.
- A general failure in the charger. If the problem persists after changing the power supply, contact ReconRobotics.

**I have headphones plugged into my OCU, but all I hear is static. Why?**

The OCU will only transmit audio if you are using an active, audio-enabled Throwbot XT Robot on the same operational channel.

## Frequently Asked Questions

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### How long will the robot run on a full charge?

The actual battery run time of a robot will vary depending on the time spent driving and the terrain the robot is crossing. On a fully charged battery, the robot should run for approximately 60 minutes.

### How long will the OCU run on a full charge?

The battery run time of the OCU is approximately 120 minutes.

### How many times can the robot and OCU be recharged?

The robot and OCU use Lithium Polymer batteries which are rated for 300 recharges before any degradation of capacity.

### How long does it take to recharge the OCU and robot?

The recharging times for the OCU and robot are approximately one to three hours depending on the current state of charge.

### Can the robot be operated in wet conditions?

The OCU should only be used in a dry environment. The warranty and Annual Maintenance Plan do not cover any damage resulting from exposure of the system to water, salt water spray, hazardous or caustic chemicals, etc.

The Throwbot XT robot is passively water resistant to a depth of one foot (30 cm) for up to five minutes.

### Where can I find the serial numbers on my robot or OCU?

**Robot:** Underside of shell, near the tail mounting point.

**OCU:** Bottom of the back side, near the lanyard mounting post.

**Format:** Eight or nine digits with an alpha character in the fifth digit.



## OCU Audio/Video Out Capabilities

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### Audio Output

The OCU is capable of receiving audio transmitted from the Throwbot XT Audio robot. To listen, plug headphones into the appropriate jack on the left-hand side of the OCU.



**Ensure you are using headphones with in-line volume control. There is no volume control on the OCU itself. Be careful to test the audio volume before using.**

### Audio/Video Output

The ReconRobotics Audio/Video (A/V) Out Cabling Package (sold separately) can be used to connect the OCU to an external monitoring/recording device (not included). The A/V Out jack is located on the left-hand side of the OCU.



Once connected to the OCU, connect the other end of the A/V Out cable to the appropriate connector on an external device. Please refer to the instruction card provided with the A/V Out Cabling Package for more information.



**Do not use third-party cables with the A/V Out jack on the OCU.**

The A/V Out cables in the A/V Out Cabling Package are specially designed to work with the OCU. Though they may look similar, cables manufactured by a third party will not work appropriately with the OCU.

### Video Only Output

If your robot does not have the capability to transmit audio, you will still be able to output a video signal through the A/V Out jack using the appropriate cable. Do not use headphones with the OCU unless you are controlling a Throwbot XT Audio robot.

## Quick Start Guide

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### Operational Specifications

- Range: up to 100 feet (30 meters) indoors or non-line-of-sight, 300 feet (91 meters) outdoors within line-of-sight
- Battery run time on full charge:
  - Robot = 60 minutes
  - OCU = 120 minutes
- Robot Speed: 1.5 feet (0.46 meters) per second
- Radio Transmission: Analog
- Robot Drop Shock Resistance: 30ft/9.1m vertical
- Robot Throw Shock Resistance: 120ft/36.5m horizontal

### Matching Frequency Channels

The operating frequency channel is indicated by a sticker on the robot and OCU. They must match for successful operation. To deploy multiple robots within the same area of operation, different channels must be used.



**Equipment on channels A.2, B.2, and C.2 is not compatible with equipment programmed to channels A, B, and C.**

### Basic Deployment Instructions

1. Charge robot or OCU if needed.
2. Rotate antennas to an upright position.
3. Switch OCU on.
4. Pull pin from robot. Confirm that robot is broadcasting video and accepting command from the OCU before deploying.
5. Drop or throw robot into target environment.
6. Wait two seconds after robot lands to allow gyroscope to stabilize before operating.



**If using headphones with a Throwbot XT Audio robot, plug in and test the headphones at a low volume before using.**

## Field Maintenance: OCU

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### OCU Field Maintenance

**Antennas:** Ensure that the antennas are not bent or kinked and that they are able to easily be rotated.

ReconRobotics does not supply any repair parts except for what is available in a Field Maintenance Kit (FMK). Repairs or modifications, other than those associated with the FMK, which are not conducted by authorized personnel will result in the voiding of warranty and/or Annual Maintenance Plans. Refer servicing to qualified ReconRobotics service personnel. (See Warranty and Repair, pg. 17)



**DO NOT DISASSEMBLE YOUR ROBOT OR OCU. There are no user-serviceable parts inside.**



Field Maintenance Kit for Throwbot XT



## Field Maintenance: Robot

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The Throwbot XT robots and OCUs are designed to provide mission critical information in harsh or hazardous environments, but no product is indestructible. In order to ensure that your ReconRobotics equipment keeps performing as expected, please follow these steps after each use of the robot and OCU.

### Robot Field Maintenance

**Wheels:** If the nut is loose, tighten the nut with a 5/16 inch nut driver. Do not over-tighten. The wheel should spin freely.

**Stabilizing Tail:** If tail is loose, use a 1/16 inch Allen wrench to tighten the bolts holding on the tail. Do not over-tighten.



**The wheels and tail are not interchangeable between the Throwbot XT & Recon Scout robot models. Use the correct parts for your model of robot.**

**Antennas:** Visually inspect for scuffing or cracking. If wire is exposed, antennas will need to be replaced.

The optimal arrangement of the antennas is sticking relatively straight up into the air with a slight slant toward each other. It may be necessary to manipulate the antennas into this position by making a sharp kink at the bottom of the antenna near the shell and straightening out any other kinks along the length of the antennas.

**IR Blister:** Lightly dust off the IR Blister to ensure the sensor is clear.

### Parts Replacement

The parts and tools supplied in a Field Maintenance Kit (FMK) allow you to replace the following parts on your Throwbot XT robot:

- Antennas
- Wheels
- Tail
- Activation Pin

## Instructions for Use: Setup

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### Setting up the OCU

Rotate antennas to an upright position as shown. The operator may rotate the antennas up or down as needed to receive the maximum range performance from the robot system while maintaining a comfortable view of the OCU screen.



**Modification of the antenna system may violate your authorization to use this product.**

### Powering the OCU

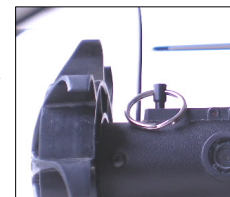
Flip the power switch at the base of the controller from the Off to the On position.



The screen should light up indicating the unit is ready to use. If the robot is powered on, video from the robot should appear. Otherwise, the screen will display static.

### Powering the Robot

- Pull the activation pin from the robot to power it on.
- Reinserting the pin turns the robot off.
- You will hear and feel a click when the pin is fully seated.








**When not in use, always ensure the OCU is switched off and the activation pin is inserted in the robot.**

## Instructions for Use: Chargers

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### Reading Charge Indicator Lights on Battery Chargers

Your kit may include one or both of these chargers. When plugged into an active power source, the indicator LEDs will display the following charge states:

	AC Dual DC Battery Charger	BA5590/BB2590 Field Charger*
		
<b>Green Light</b> 	Fully charged OR Not plugged into OCU/ robot	Fully charged  NOTE: LED light may shut off after charging is complete
<b>Red Light</b> 	Charging	Charging
<b>No Light</b> 	Not receiving power from outlet	Not plugged into OCU/robot OR Charging is complete (fully charged)
<b>Blinking Light</b>	Charger is connected incor- rectly. Unplug everything and start over (refer to page 8 for instructions).	N/A

\*Battery not included.

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### Throwbot XT & XT Audio AC Dual DC Battery Charger

1. Turn off OCU and insert activation pin into robot to deactivate before charging.
2. Plug AC electrical cord into the charger. (NOTE: charger **must** be connected to a power source before robot or OCU for proper operation)
3. Plug AC electrical cord into the proper country-specific AC wall socket (120-240 VAC).
4. Plug the appropriate charger cords into the OCU and robot. Ensure connecting plugs are not bent during insertion or removal. Ensure that the red dot on the connecting plug is aligned with the red line on the robot when inserting (see image at right).
5. Remove robot and OCU from charger when charging is complete.



**To prevent battery damage, DO NOT use any chargers other than those supplied by ReconRobotics.**



### Throwbot XT & XT Audio BA5590/BB2590 Field Charger

1. Turn off OCU and insert activation pin into robot to deactivate before charging.
2. Plug electrical cord into a 5590 or 2590 battery.
3. Plug the appropriate charger cords into the OCU and robot. Ensure connecting plugs are not bent during insertion or removal. Ensure that the red dot on the connecting plug is aligned with the red dot on the robot when inserting (see image above).
4. Remove robot and OCU from charger when charging is complete.



**The charger plugs are NOT interchangeable. Inserting the wrong plug into the robot or OCU could result in permanent damage.**

### General Instructions & Recommendations

- Place the chargers in a cool, ventilated, fire-safe area.
- Charge your robot and OCU once per month, even if they were not used. This will ensure the batteries are kept topped off to ensure the robot is always ready for immediate deployment.

# ***FCC Logbook***

### FCC Class B Product Compliance

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Although this transmitter has been approved by the Federal Communications Commission, it must accept any interference received from Federal or non-federal stations, including interference that may cause undesired operation.

When multiple Recon Scout robots are available on separate frequencies, the agency deploying them must deploy a Channel C Recon Scout robot first, followed by a Channel A, followed by a Channel B.

**Changes or modifications not expressly approved by ReconRobotics could void the user's warranty and could void the user's authority to operate the equipment.**

To comply with FCC RF exposure compliance requirements, the antenna used for the robot's transmitter must maintain a separation distance of at least 20 cm from all persons during use and must not be co-located or operating in conjunction with any other transmitter except in accordance with FCC multi-transmitter product procedures.

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## FCC Guidelines

The usage of the Recon Scout® robot and related equipment is subject to the following conditions:

Eligibility is limited to state and local police and firefighters eligible for licensing under Section 90.20(a)(1) of the Commission's Rules, and security personnel in critical infrastructure industries.

The Recon Scout robot may be used only during actual emergencies involving threats to safety of life, and for necessary training related to such operations. Security personnel in critical infrastructure industries may operate the Recon Scout robot only in areas that are environmentally hazardous for entry by human personnel, and for necessary training related to such operations.

Training operations are not permitted within thirty kilometers of the following Federal radiolocation sites:

Site	Coordinates (degrees-minutes-seconds)
Beale Air Force Base	39-08-10 N / 121-21-04 W
Cape Cod Air Force Station	41-45-07 N / 70-32-17 W
Clear Air Force Station	64-55-16 N / 143-05-02 W
Cavalier Air Force Station	48-43-12 N / 97-54-00 W
Eglin Air Force Base	30-43-12 N / 86-12-36 W

The Recon Scout robot will operate on a secondary basis (cannot cause interference and is not protected from interference) to all Federal users and licensed non-Federal users. **This device may not interfere with Federal stations operating in the 420-450 MHz band and must accept any interference received.**

The operation of the Recon Scout may be impacted in the vicinity of the following radar and ionospheric research sites:

Site	Coordinates (degrees-minutes-seconds)
Arecibo, Puerto Rico	18-20-37 N / 66-45-11 W
Westford, Massachusetts	42-37-24 N / 71-29-18 W
Poker Flats, Arkansas	65-07-47 N / 147-28-14 W

## FCC Logbook

The usage of the Recon Scout robot is subject to maintenance of a logbook. Please use the following sheet to record the date of operation, the start and stop times, channel information, the location of usage, a brief reason for usage and a point of contact. This logbook must be made available upon request of the Federal Communications Commission or the National Telecommunications and Information Administration.

Refer to your User's Manual for serial numbers and channel information. The next page may be photocopied, or additional pages are available from your authorized ReconRobotics dealer.

Date	Start	Stop	Location	Reason	POC