



**Advanced Training Systems**

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# MT-7X Series of Robots

## Operations Manual



**ALWAYS POWER ROBOT FIRST**

NOTE: Before servicing the MT-7X Robotic Platform, please read and understand the following instructions completely. If you need assistance please contact:

## Advanced Training Systems

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### Installing the Batteries in the MT-7X:

1. Ensure the power switch is in the OFF position.
2. Remove the covers by unscrewing the tricorn knobs at the back of the machine.



3. Slide battery pack into machine



4. Tighten knobs



5. Connect the large red connector to red and grey connector to grey. The connector will only mate in one direction to ensure polarity. To disengage, firmly pull the connectors apart. CAUTION: Do not pull on the wires; only use the connector housing.



6. This unit operates at 24V. The motors as well as the motor controller are rated at 24V. The combination of batteries supplies 24V. The unit will operate down to 14V (7V in each pack) before under-voltage shutdown occurs. However, at this low voltage, the unit will move much slower and operation is not recommended due to the possibility of battery deep discharge.

7. Once batteries are connected and in place, replace the back cover.

Installing Batteries in the handheld Target Controller:

1. Slide the bottom cover towards the front of the unit.
2. Insert 8 AA alkaline batteries in the battery holder.
3. Re-insert the cover in the slots, then snap shut.

Refer to the manual included with the transmitter for further information.

### Powering the MT-7X Unit ON (**ALWAYS POWER ROBOT FIRST**):

1. For safety purposes, the handheld target controller should be turned on **AFTER** the MT-7X Platform is powered to the ON position. Once the TARGET is powered, you can turn the switch ON at the MT-7X. It is very important that when powering ON the MT-7X, you do not touch the controller's trigger or steering wheel. Doing so could cause the MT-7X to move without warning. When operating the power switch you should hear an audible mechanical click from inside the MT-7X. This click indicates the power control relay is operating normally. This click is not the switch.



2. Turn Power OFF when not in use. Make sure you turn the power OFF at the MT-7X platform first, then the controller can be powered OFF.

### Powering the Controller (**ALWAYS POWER ROBOT FIRST**):

1. Slide the power switch to the ON position without touching the trigger or the steering wheel.
2. Verify battery voltage on the display. Replace batteries if "Low" condition is displayed.
3. Turn power off when not in use, One must turn the MT-7X Platform off first.

### Operation of the MT-7X:

Both the trigger and steering wheel have linear speed control. The further you pull the trigger or turn the wheel, the faster the unit will respond.

### Straight:

To make the MT-7X go straight, pull the trigger on the remote without turning the wheel. The further you pull the trigger, the faster the unit will move.

### Turn:

Without pulling the trigger, by rotating the wheel one way or the other, the unit will respond with a move in that direction. The unit operates on the principle of skid steering, meaning the tires on opposite sides of the platform turn in opposite directions to make the turning motion. If you turn the wheel fully in one direction, the MT-7X will spin in circles on its own diameter. CAUTION: Although fun, this creates increased tire wear.

### Forward and Turn:

To make the unit go forward and turn gently, pull the trigger and rotate the wheel one direction or the other to initiate a turn. When pulling the trigger at full speed, the unit will not turn. You must reduce speed slightly to allow the unit to turn. This safety feature ensures the unit travels in a straight line at full speed.

### Reverse:

The unit operates the same in reverse. To make the unit move in reverse, push the trigger by extending your finger upwards.

Refer to the manual included with the transmitter for further information on the transmitter's operation.



### Mounting the Paper Target Holder:

1. Select an orientation for the holder if required.
2. Remove the black T handle nuts.
3. Place the holder over the studs on the top of the platform.
4. Re-install the black T-handle nuts to securely fasten the holder in place.
5. Install the Mannequin target or 2x2 poles as desired.

Ensure that the target is a safe distance above the MT-7X to avoid any stray rounds from impacting the platform.

Since the MT-7X platform is compatible with many different ATS target systems like the PT-61 and PT-51 tactical targets, special adapter brackets will be required. For those brackets, a separate instruction sheet will be included along with any necessary hardware.



## Mounting the Stop/Drop:

Note the location of the power switch on the side. Ensure that it is in the off position. The antenna is mounted on the top deck.

To mount the post ensure the power switch is in the off position, mate the circular on the side of the platform with the pigtail inside post. Mate the connector and lock the collar on the circular connector. After the connector is mated, bolt the post in place with the provided hardware, the switches are placed to the rear (battery end with blank plate). The base platform will not operate without the post mounted. It is possible to create a jumper to test the base unit. Contact the factory for this option.



## Charging the MT-7X Batteries:

The batteries may be removed or left in the unit for charging. To charge the batteries, simply connect the pack to a high frequency, 12 VDC smart charger. It is essential that a smart charger be used to charge the packs. Smart chargers charge the packs at a high rate and taper the charge as the packs near full charge. Once a full charge is completed, the chargers will remain in the float state, keeping the batteries topped off and avoiding overcharging, which decreases battery life and performance. Either two individual chargers or a single, dual bank charger should be used. Do not connect both battery packs to a single bank charger.

## MT-7X Antenna:

The red tube sticking up from the top of the MT-7X is the unit's receiving antenna. Take care not to bend or damage this tube as it will affect the MT-7X platform's effective control range.

### MT-7X Receiver and Motor Controller:

The motor controller and receiver are housed under the center of the platform. There are no serviceable parts for either the motor controller or receiver, so there is no need to remove this cover.

### MT-7X Power Switch:

The power switch is a sealed toggle switch (DPDT ON-ON). To replace the switch in the event it becomes damaged:

1. Disconnect the batteries.
2. Remove the 4 screws on the switch plate; pull the switch assembly out.
3. Note the position of the wires. The center terminal has the white and yellow wires on it. The OFF position of the plate should have the red wire. The ON side of plate should have the 2 black wires on it.
4. Remove the damaged switch. Replace the new switch into the plate.
5. Re-install the plate to the chassis using the 4 screws.

### Stop/Drop:

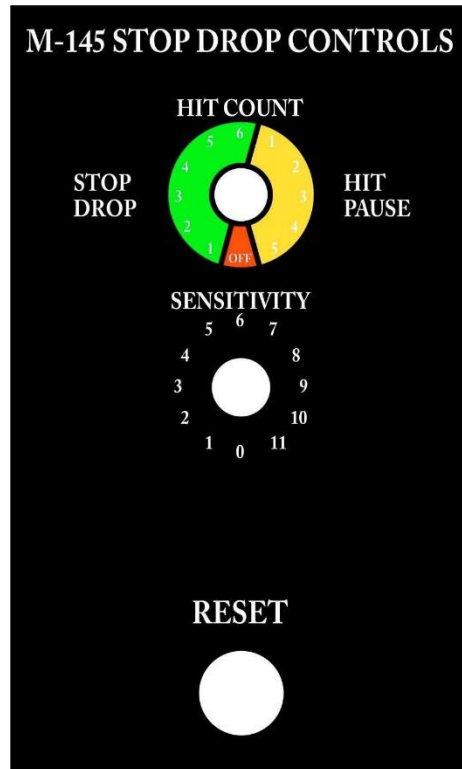
Upon power up the hit detection system is disabled. To enable simply press the Red Reset Button located on the back of the post.

The unit is shipped from the factory with the hit detection board disabled. There are two modes of operation. The first mode is Hit-Stop the second is Hit-Pause. In hit stop mode the unit detects and counts, when the correct count is reached the unit will stop, drop the mannequin and wait for the dummy to be replaced and reset button pressed. In hit pause mode the impacts are counted and the when the count is reached the platform will pause for 5 seconds and resume motion as commanded after time expires.





There are two Knobs on the post to control the hit settings. The top knob sets the count and mode. The bottom knob sets the sensitivity. Any time a change is to be made the power should be turned off. Upon power up, the reset button must be pressed to energize the post.

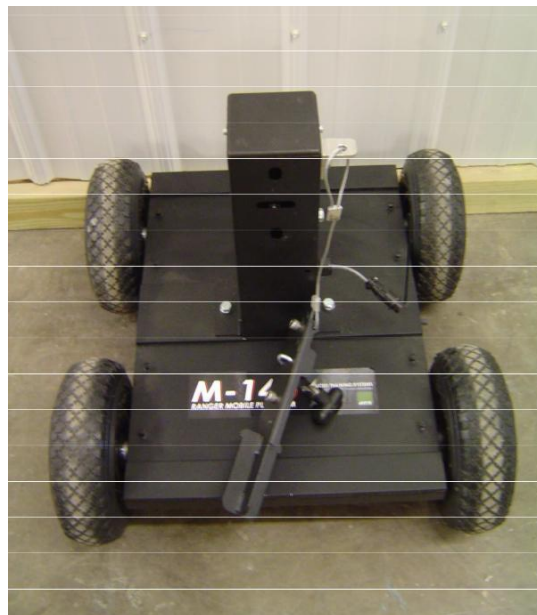


The top knob controls 3 modes. When set to 0 the post is disabled. Pressing the reset button with the knob set to 0 will cause the latch to disengage. Positions 1-6 control Hit-Stop/Drop mode with the number controlling the number impacts to activate the latch. Positions 7-11 on the switch control the Hit-pause mode with 1-5 hits to activate.

The bottom knob controls sensitivity. 0 is the most sensitive. The larger the number the bigger the impact required to trip the sensor. The normal range for operation is 4 through 8 depending on the caliber used. A knob setting of 4 works well with 5.56mm rounds. A setting of 6 will work well with 40 S&W.

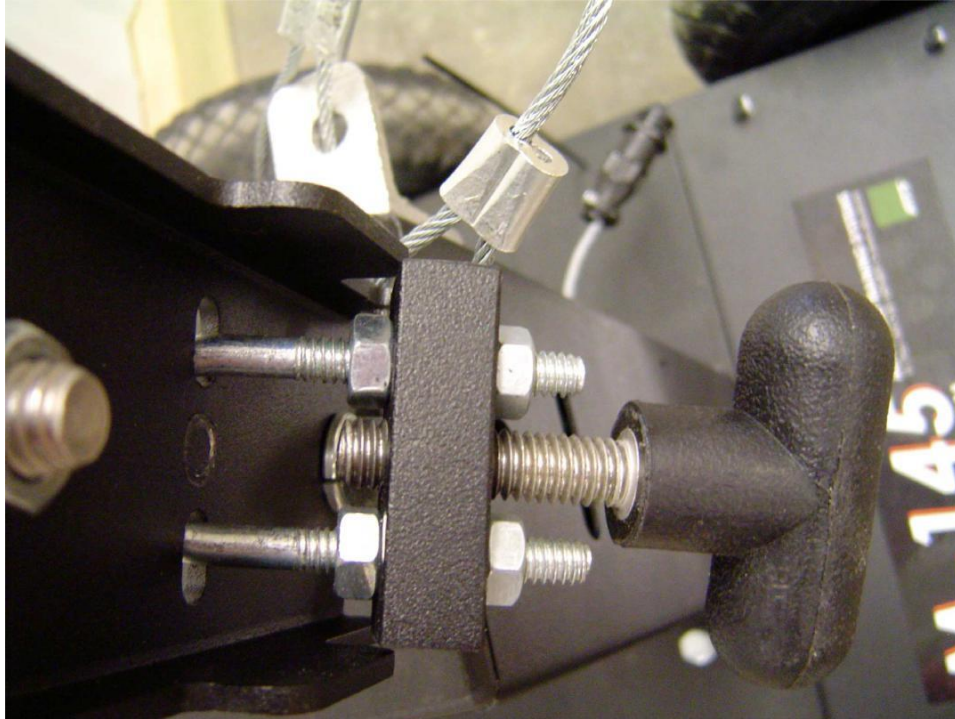
Setting the sensitivity is a balance of not detecting bumps and vibrations from the MT-7X platform in motion but detecting bullet impacts to the torso. To experiment with the sensitivity set the Hit-Pause to 1, press the reset button and drive the unit around. If the platform stops and pauses it is detecting false triggers, increase the setting on the bottom knob. Once no false hits are detected test with live fire to ensure the unit operates correctly. The power should be turned off and the reset button must be pressed any time a change is made to the knob settings.

In Stop/Drop mode the bracket is released from the latch when the correct number of impacts has been detected.



The bracket is tethered to the post. Removing the tether can cause the bracket to fall straight down crushing the covers. Do not remove the tether.

To replace the bracket after it has fallen, loosen the hand knob 1 to 2 turns. This will give enough slack in the U-Bolt to allow the latch to engage.



After loosening the hand knob, grab the knob and bar attaching the U-Bolt in the palm of your hand pressing the U-Bolt as far through the bracket as possible. Guide the 2 Pins into the matching holes in the post and the U-Bolt into the slot. You will feel the Latch engage. If the latch does not engage, loosen the hand Knob further and retry.



Once the bracket is latched in place, tighten the bracket to the pole by turning the hand knob. If the bracket is too loose the mannequin will flop all over. There is no need to over-tighten the knob, it is only required to snug the bracket and take up most of the slop.

Once the bracket is in place the 2" PVC pole can be placed over the bracket with the mannequin on top of the Pole.





The mannequin is shipped from the factory ready to be assembled and pre-wired. If replacing the sensor it is important to place the duct tape over the sensor as shown below. When assembling the mannequin ensure the legs are mounted as shown above and the wires are routed as shown.

The pole has a large screw in the top of the post, remove this screw before inserting the pole into the body. There are two washers on this bolt. It is recommended that the star washer be placed between the top of the pole body, inside the pocket. The large flat washer goes directly under the bolt head.



The bottom end of the pole is keyed to keep the mannequin aligned. The back of the pole has an indication line, this line marks key slot for the pole. This indicator marks the back of the pole. The bracket has 4 tabs, one of which is  $\frac{1}{2}$ " taller than the rest, this is the key and is the rear of the unit. When installing the post into the mannequin, align the mark before tightening the screw.



### MT-7X Tires:

The MT-7X tires have tubes in them. If for some reason you get a flat, it is easy to replace the tube.

1. Let all the air from the tire.
2. Remove the 4 large Phillips head bolts from the wheel.
3. Split the rim. It is two pieces and should easily come apart.
4. Pull the old tube out.
5. Insert the new tube.
6. Thread the valve stem through the hole in the outer rim.
7. Assemble the inner rim and secure to the hub using the 4 bolts removed in step 2.
8. Inflate the new tube to about 15 psi. Do not over inflate, as the unit will bounce unnecessarily. If the tires are under-inflated, the tires will spin on the rims and could damage the tubes.

Wheel hubs are glued to the motor shafts using an industrial retaining compound. Do not attempt to remove them as you may damage the hub or motor unit.



# MT-7X Spec Sheet

## MT-7X

Weight (w/ 2 batt. Packs)	120#
Foot Print	31"x26"x10" (LxWxH) w/ bumpers
Carry capacity:	150#
Radio:	2.4 GHz Spread Spectrum Futaba Style
Maximum Effective Range:	Up to 1000 meters line of sight
Run Time	3 hours/2 battery packs (50% duty Cycle)
Tire Size	10"x3.5" Pneumatic
Motor	4 – 24V 120W 270rpm IP44 Direct Drive Motors
Speed (forward/reverse)	0 to 11.75 feet/second variable speed
Color	DARK GREY

## Optional Mounts

Dual Stake Pockets  
PT-61 A or B Pop up Target Mount  
PT-51 Dummy Dumper Reactive Target  
Stop/Drop Manikin Mike™ 3DHT  
Stationary Manikin Mike™ 3DHT  
Army E, F, IVAN 2D Silhouettes  
Surveillance cameras  
IED search and destroy missions  
Portable lighting systems  
Mobile phone holder (for hostage negotiations)



**CAUTION:** Be sure to read, follow and understand the following instructions.

Failure to follow this instruction manual may result in serious bodily harm to yourself or others.

**Do Not Ride This Device.** The MT-7X Platform is not designed to carry passengers.

This device is a radio controlled, wireless device operating in the 2.4 GHz unlicensed frequency band. It is possible that interference from an outside source could cause unwanted movements of the unit. Ensure all users and bystanders are alert and clear of the unit.

This unit is not 100% waterproof. Driving this unit through puddles, lakes, streams, rivers, snow, ice, sleet or rain could damage the unit.

The MT-7X platform moves fast and is heavy. Slamming the bumpers into people or stationary objects can cause substantial damage to the unit, the object, or bodily harm to the person. Avoid this at all times.

This unit is not a tow truck or plow. Using this unit to pull or push heavy unapproved objects is not recommended. It could cause severe damage to the unit.

Continuing to apply power to the unit when stuck (when at least one wheel on each side is not turning) will likely damage the electronics. This stall condition will cause the motors and motor controller to overheat and could cause permanent damage.

Turn the power OFF when not in use.

Do not drive the unit off jumps and ramps. Do not drop the unit. Do not jump onto the MT-7X. Any of these actions could cause the chassis to bend or may cause damage to the motors and motor shafts.