

MOVING iMAGE TECHNOLOGIES

INSTRUCTIONS

FOR

INSTALLATION, OPERATION, AND MAINTENANCE

OF

XL Mover / XLW Mover

Manual Version 1.0

MOVING iMAGE TECHNOLOGIES, LLC.

17760 Newhope St.

Fountain Valley, CA

Telephone: (714) 751-7998

Fax: (714) 429-7717

www.movingimagetech.com

Manual

XL Mover / XLW Mover

The information in this document is subject to change without notice and does not represent a commitment on the part of Moving Image Technologies (hereinafter referred to as MIT). MIT does not assume responsibility for errors that may appear in this document. MIT or its subsidiaries, designated representatives and any other vendor of the XL Mover are not responsible in any way for any liabilities or loss resulting from the use or misuse of this document.

Copyright © 2013 by MIT
All Rights Reserved

All copyrights and trademarks are the property of their respective owners.

MOVING iMAGE TECHNOLOGIES, LLC.
Fountain Valley, CA
Telephone: (714) 751-7998
www.movingimagetech.com

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. GENERAL INFORMATION	2
2. ASSEMBLY & INSTALLATION	3
3. ELECTRICAL CONNECTIONS	5
4. LIMIT SWITCH ADJUSTMENT	8
5. MAINTENANCE & TROUBLESHOOTING	10
WARRANTY & SPARE PARTS	11
APPENDIX: REAL D MOUNTING KIT	13

1. GENERAL INFORMATION

1.1 Description

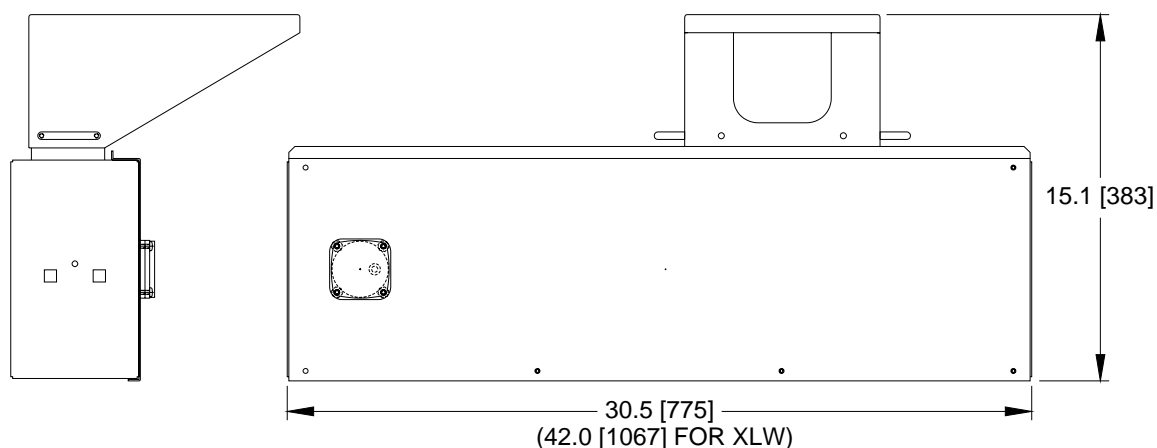
The MIT XL Mover series is designed to support the XL 3D optical head from Real D. The device allows the 3D unit to be moved in or out of the optical path via a motorized linear carriage, controlled remotely. The product incorporates several advanced features, including:

- **Silent operation:** a special drive motor and gearbox has been implemented that greatly reduces the noise during operation. It is typically quieter than the projector fans.
- **Two-speed drive:** The carriage begins and ends travel at low speed for minimum shock to the optical components, but transitions to faster speed for the majority of the travel.
- **Safety time-out:** The control board will attempt to drive the carriage for approximately 10 seconds (20 seconds for the XLW model). If the carriage hasn't reached the end of travel within that time, the control board stops driving the motor and the drive mechanism will go slack. This is a safety feature to protect against damage if something is blocking the path, and also reduce the likelihood of injury to personnel.
- **Fault indication:** If the carriage doesn't reach the end of travel before the time limit, the red LED on the end of the unit will illuminate. The red fault indication will extinguish after the unit has made another successful move the same direction, within its allotted time.
- **Manual operation:** the carriage incorporates handles on both sides, and may be manually pushed either direction at any time without damaging the drive components (it's recommended to move it at a gentle speed so it doesn't damage the stop when it reaches the end).

1.2 Control Panel

The Operator end of the XL Mover chassis includes a control panel with manual switches to activate '2D' and '3D' positions. The activation buttons are illuminated. The brightly illuminated button indicates the current position of the carriage. This is also where the red fault LED is located. The XLW unit has these features transferred to a remote panel.

1.3 Physical Outline



2. ASSEMBLY AND INSTALLATION

The XL Mover mounts to the front of MiT pedestals series 1, 2, or 3. You will normally require the mounting kit from Real D, p/n 0030049-001 (see Appendix for parts included). Note: if you have all the needed parts except for the rack mounting brackets MiT can supply those, MiT p/n C001413-001 (2ea required). The XLW version normally mounts to a wall. You may also mount the standard XL-Mover to a wall. If mounting to a wall you may use the same Real-D mounting brackets or another method.

2.1 Installation Procedure (base)

The XL Mover may be mounted to the brackets by a single person by following the steps below. Please read all the instructions before beginning the process.

1. If the mounting brackets aren't already mounted to the base, attach them as shown in Figure 2-1. They should be approximately centered vertically on the mounting hole pattern on the front of the base. The brackets are symmetrical, there is no left or right or top or bottom.
2. Use a minimum of six (6) 10-32 UNF or M5 screws to mount the brackets (pan head or socket head may be used). Two screws should be used on each side near the top. Add one or two more screws near the bottom. Additional screws may be added if desired, but aren't necessary.
3. The mounting bracket screws are in slots to accommodate minor manufacturing tolerances. Note the dimension shown in Figure 2-1 of 23.00 inches between the mounting hole centers. You can measure this and set it precisely before tightening the bracket mounting screws. But it will be easiest if you don't tighten the screws at this point, but leave them about one full turn from being seated so the position of the brackets can be adjusted later.
4. Remove the front cover from the XL Mover. Remove the four ¼-20 UNC screws from the rear side of the XL Mover. Raise one end of the XL Mover until one of the ¼" holes on the bracket lines up with a threaded hole near the top of the XL Mover. Start the screw in the hole. Raise the other end of the XL mover and insert another screw near the top of the XL mover on the other side.
5. Insert two more ¼-20 screws in holes near the bottom of the unit.
Note: There are 8 threaded mounting points provided on the rear of the XL Mover chassis. Only four ¼" screws are required to secure the unit. There are extra mounting points so you may select different holes to obtain different final heights of the assembly on the pedestal.
6. With a long screwdriver (or hex wrench), insert the driver through the rack pattern holes in the rear of the XL Mover chassis and tighten the screws securing the mounting brackets to the pedestal that were left loose in step 3.
7. Attach the upper portion of the XL Mover carriage to the lower portion using the screws provided. Note: remove the screws holding the handles on the sides, then reassemble with the upper carrier in place.
8. Mount the Real D "core" and XL unit to the top of the XL Mover carriage according to methods designed and provided by Real D in the kit supplied.

This completes the physical mounting and assembly of the XL Mover to a pedestal.

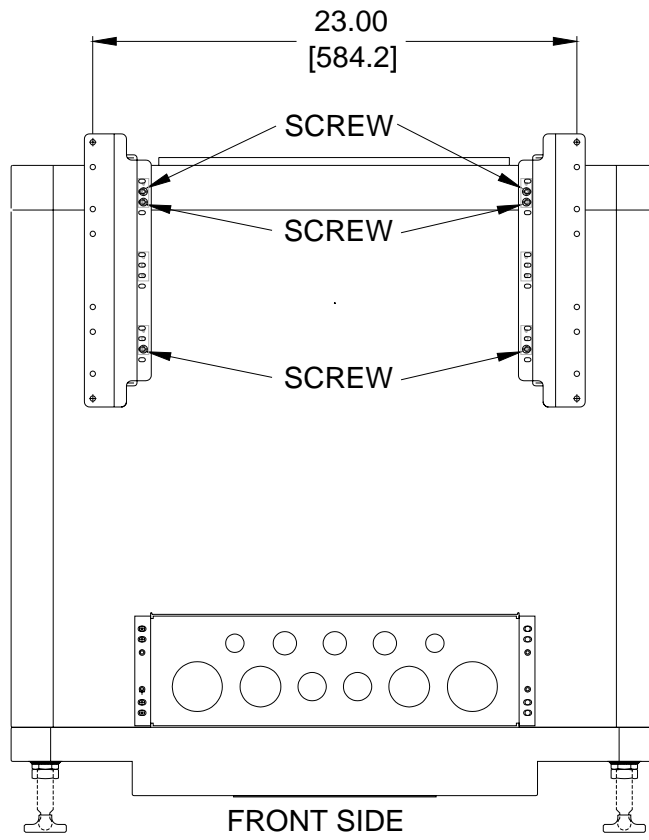


Figure 2-1

3 ELECTRICAL CONNECTIONS

3.1 AC Power Input

The XL-Mover requires AC power in order to operate. The unit comes with a 24VDC universal type power supply. The power supply accepts 100-240VAC, 50/60 Hz. Power consumption is 0.5A max. The output of the power supply connects to jack J1 on the PCB inside the unit. A hole in the enclosure is provided for running the 24V power and control wiring to the unit

3.2 Control Input

Control connections are made to J3 on the PCB. To ensure the most reliable operation, see the figures on the next pages for connection diagrams and corresponding jumper settings for JP1, JP2, and JP3. Use the preferred connection methods shown in order to maintain isolation between the control device and the XL Mover electronics.

MiT can supply a control cable designed for your specific intended control method, contact the MiT Engineering department for more information.

3.2.1 Connection diagrams, 3-Wire interface (typical for control by automation)

Note: Jumpers at JP2 and JP3 must always be in the same position on both headers. Disconnect power before changing jumpers. External control components shown for reference.

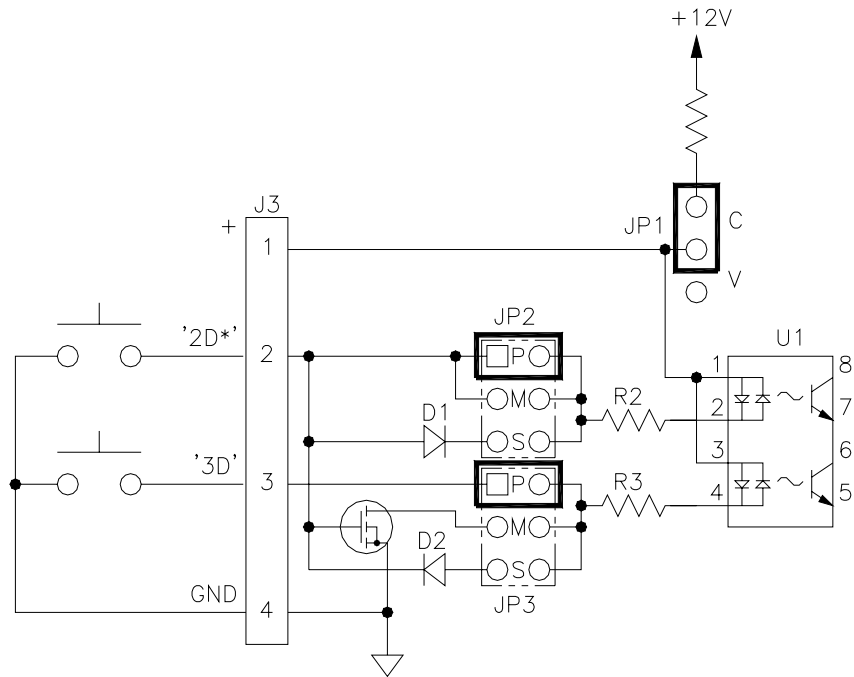


Figure 3.2.1-1: Control Device has Dry Contact Pulsed output
(to maintain isolation there should be no connection to V+ or Gnd at the control device)

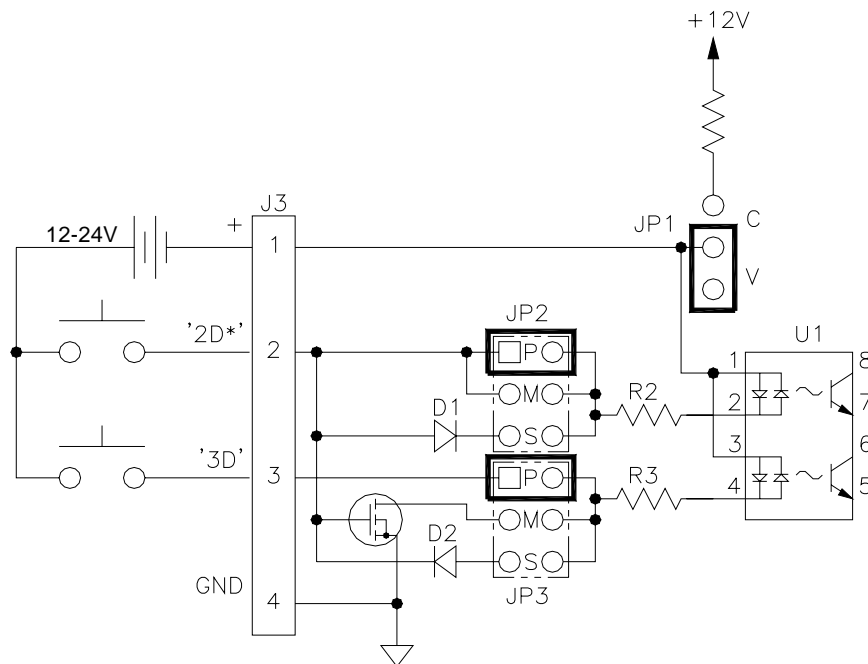


Figure 3.2.1-2: Control Device provides Switched Pulsed Voltage
Note: Polarity of the control voltage is not important, polarity shown is for reference only.

3.2.2 Connection diagrams, 2-Wire interface (typical for control by projector)

Note: Jumpers at JP2 and JP3 must always be in the same position on both headers. Disconnect power before changing jumpers. External control components shown for reference.

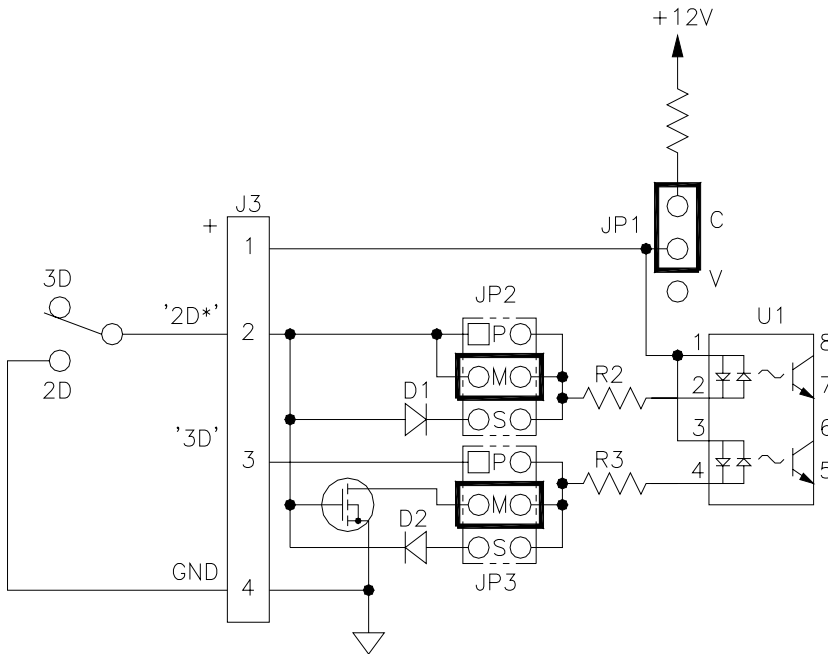


Figure 3.2.2-1: Control Device has dry contact, maintained output
(Ex: Barco Projector GPO)

Maintained contact closure will keep the unit in the '2D' position.
Opening the connection goes to '3D' position.

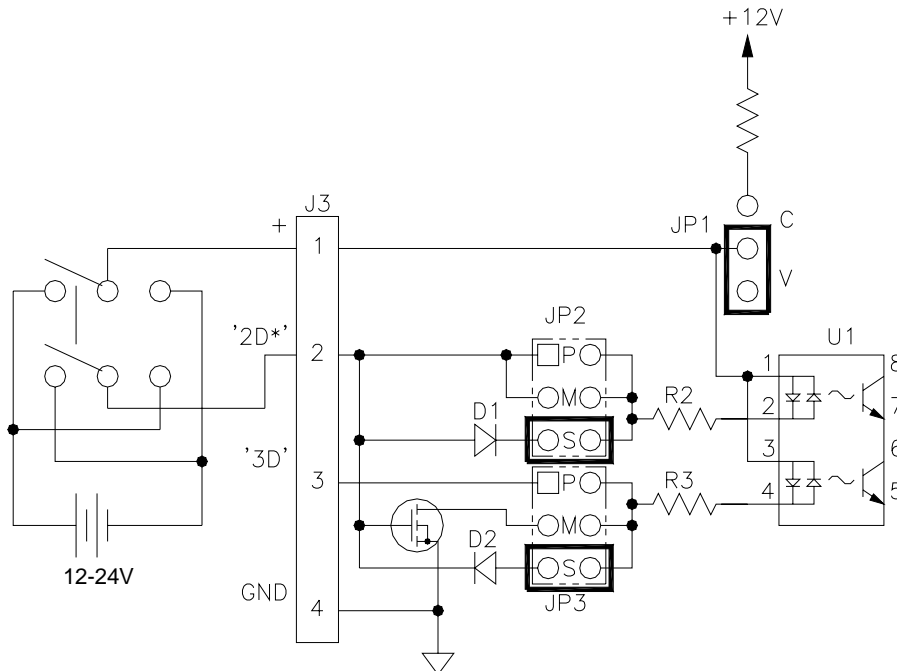


Figure 3.2.2-2: Control Device provides voltage, Swaps Polarity to Change Position
(Ex: NEC Projector XLR lens turret connector)

(Note: J3 Pin 2 must be positive (+) for 2D, negative (-) for 3D.
If this is opposite, simply swap the connections to J3 pins 1 and 2.)

4. LIMIT SWITCH ADJUSTMENT

The XL Mover has limit switches at both ends of travel for setting the stop positions. Each limit switch incorporates two microswitches and a rubber bumper in the same assembly. Normally the limit switch at the '2D' end is set all the way at the end of travel, to get the XL unit as far away from the projection axis as possible when it's not being used. The limit switch at the '3D' end of travel may require adjustment depending on the specific model of projector being used. Follow the procedure below to adjust the limit switch assembly.

4.1 Limit switch adjustment, Standard

This procedure may be followed for Barco projector models. For other projectors, you should also see Sec. 4.2.

1. Remove the front cover of the XL Mover, if not already removed.
2. Remove two upper and lower screws on the limit switch bracket, and loosen the screw in the slot at the center. See Figure 4-1
3. Manually slide the carriage until the Real D XL unit is aligned with the optical axis of the projector lens.
4. Slide the limit switch assembly until the rubber bumper contacts the carriage. Insert the upper and lower two screws in the bracket in the nearest mounting holes. Tighten all three screws.

Note: Tighten the screws while the carriage is in contact with the rubber bumper. The switch assembly will self-align with the switches centered on the steel tab.

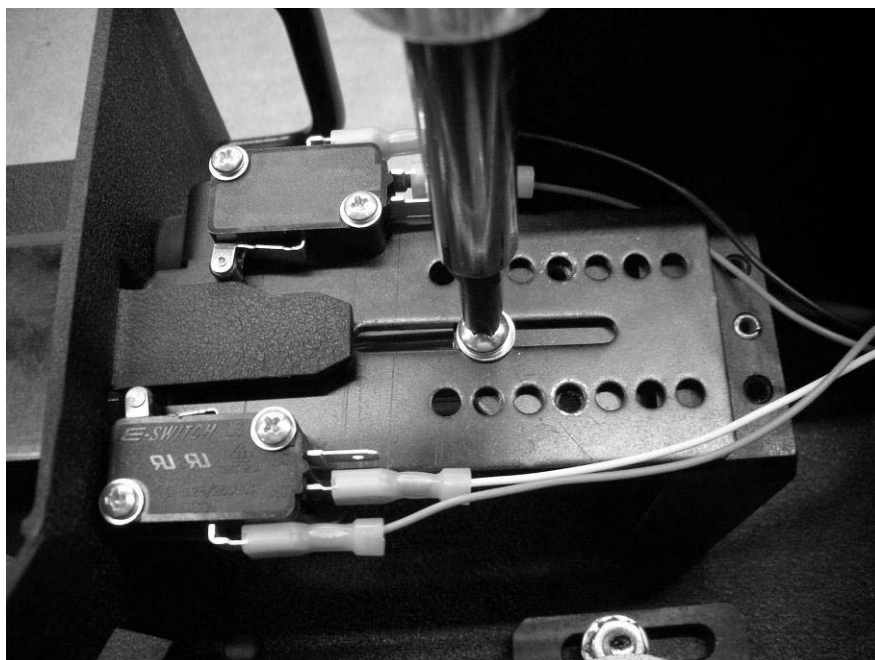


Figure 4-1

4.2 Swapping 3D Ends

There's an extender bracket that extends the range of the limit switch by 1.5". The bracket is intended for use at the '3D' end of travel, which is assumed to be the "non-operator" or end of the unit by default, intended for projectors such as Barco or NEC with the optical axis shifted toward that side. On projector models where the projector lens is offset toward the operator side of the projector, you may need to remove the extender bracket and move it to the other side to get sufficient range for the limit switch in the projection position. See Figure 4-2.

If this applies to your situation, remove the limit switch bracket assemblies from both ends. Then remove the switch extender bracket from the non-operator end and re-install it at the operator end. Then remount the two limit switch bracket assemblies.

Switch Extender Bracket

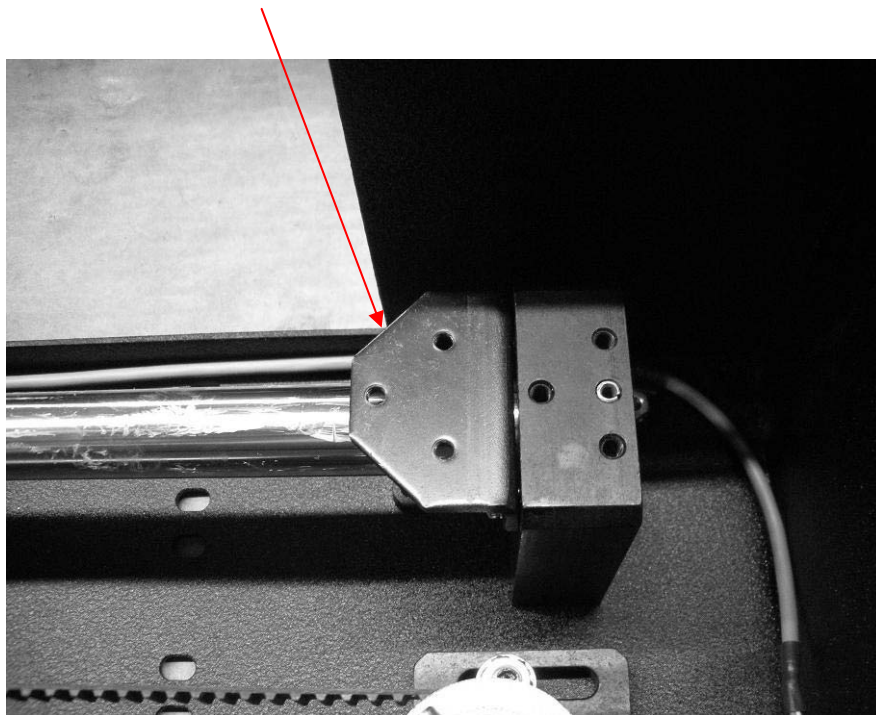


Figure 4-2

5. MAINTENANCE & TROUBLESHOOTING

Like any mechanical assembly with precision moving parts, the XL Mover requires periodic preventative maintenance. If the red fault light is seen to be illuminated, that may be a sign that one of the items below should be checked.

5.1 Lubrication

At least once per year the support shafts should have a thin layer of lubricant applied to them. The preferred lubricant is white lithium grease with PTFE added, NLGI grade 1.5. This is custom formulated for MiT and available as our part number PC00030-004. This part number is for a 4 oz tube which will lubricate approximately 40 XL Movers, or is a lifetime supply for one system.

As a check, every three months the carriage should be moved manually to make sure it moves freely and without any obstructions.

5.2 Belt Tension

The Carriage is moved by the motor driving a toothed belt. The belt is tensioned at the factory using a special fixture that applies 7.5 lb of tension to it during the assembly process. It shouldn't need adjustment.

If the belt tension is too high it will create more friction in the drive motor, and slow down the travel of the unit, potentially causing a fault. It will also cause the bearings in the motor to wear prematurely.

If the belt tension is too low it may cause the belt to slip when the motor is trying to move the carriage, especially as the carriage nears the non-operator end of travel. If the belt slips when the motor is attempting to drive the carriage, it may need to be tightened. In that case:

1. Remove the front cover of the XL Mover.
2. Make sure the ¼"-20 screw on the end of the XL mover is tight.
3. Loosen the two ¼" nuts that secure the idler pulley assembly.
4. Tighten the ¼"-20 tensioning screw ¼ turn clockwise. Retighten the nuts and re-check the tension. MiT recommends tightening the tensioning screw no more than ¼ turn at a time until the slippage is stopped.

Important Note: When the carriage is moved manually until it hits the stop, it's normal for the belt to slip a tooth or two around the motor pulley. This is due to the inertia of the motor and is normal. If the belt slips a tooth it will cause a bang sound. This won't harm any of the parts, as long as this is only done occasionally. This slippage is NOT a reason to tighten the belt! There's no 'timing' or positioning that will be wrong as a result of slipping a belt tooth, the limit switches sense the position of the carriage directly, not the position of the motor pulley.

MiT advises when moving the carriage manually, to move it slowly and be gentle as it nears the stop. If you regularly move the carriage hard enough to cause the drive belt to slip a tooth when the carriage reaches the hard stop at the end of travel, you may damage the teeth on the belt over time and require the belt to be replaced.

Standard Product Warranty

WARRANTY, DISCLAIMERS AND LIMITATION OF LIABILITY

Unless otherwise noted, all Moving Image Technologies products are covered by the warranty set forth in the following paragraphs.

The warranty is extended only to the purchaser of the Products directly from Moving Image Technologies, or an authorized dealer of Moving Image Technologies, as new merchandise. For a period of twelve (12) months from the date of original delivery to Buyer, the Products are warranted to be free from functional defects in materials and workmanship, provided they are operated under condition of normal use, and that repairs and replacements are made in accordance herewith. Moving Image Technologies does not warrant consumable components. The foregoing warranty shall not apply to Products that have been disassembled, altered or repaired other than by Moving Image Technologies (or by a Moving Image Technologies certified technician) or if the Product has been subject to abuse, misuse, negligence or accident.

Moving Image Technologies sole and exclusive warranty obligation and Buyer's sole and exclusive warranty consists of Moving Image Technologies, at its option, repairing or replacing free of charge Products: (a) which contain a defect covered by the above warranty; (b) which are reported in writing to Moving Image Technologies not later than seven (7) days after the expiration of the twelve month warranty period; (c) which are returned to Moving Image Technologies promptly after discovery of the defects; and (d) which are found to be defective by Moving Image Technologies upon examination. Buyer shall pay all transportation charges.

Moving Image Technologies shall not be otherwise liable for any damages, including, without limitation, loss of profits or overhead, reimbursement, personal injury or property damage. The aforesaid warranty obligation of Moving Image Technologies constitutes its sole liability, and under no circumstances, shall the maximum liability of Moving Image Technologies under any legal theory (e.g. Contract, warranty, negligence, promissory, estoppels, strict liability, misrepresentation, tort) and for any reason whatsoever (e.g. Defect, delay or otherwise) exceed the purchase price of the defective part, regardless whether the claim is asserted by buyer or any other person or entity. The liabilities of Moving Image Technologies, as above set forth, shall not be extended because of advice given by it in connection with the design, installation or use of the products or parts thereof.

There are no express or implied warranties which extend beyond the warranties set forth above. Moving Image Technologies makes no warranty of merchantability or fitness for a particular purpose with respect to the products or any parts thereof.

This warranty is subject to change at any time without notice.

CONTACTING MIT

To order parts or request information from MIT, use the address, telephone number, or fax number given on the inside front page of this document. When contacting MIT be prepared to provide:

- Model and serial number.
- Part name and part number, as shown in this manual.
- Purchase order number.

The purchase order number is essential for replacement parts requested under warranty. MIT issues credit for defective parts received. Please request a Return Authorization number from MIT for any defective parts.

Accessories & Replacement Part numbers

A000360-001	XL Mover, Standard (30.5" long chassis)
A000360-002	XL Mover, Wide (42" long chassis)
A000364-001	XL Mover Control PCB Assy
C001413-001	XL Mover Mounting Brackets (2ea required)
PC00030-004	XL Mover bearing Lubricant, special formulation
PE00600-001	XL Mover Drive Motor
PM00003-262	XL Mover Drive belt, 262 Teeth (52.4")
PM00003-385	XLW Mover Drive belt, 385 Teeth (77.0")