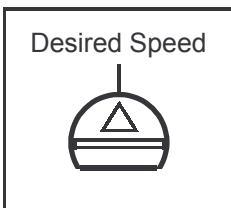
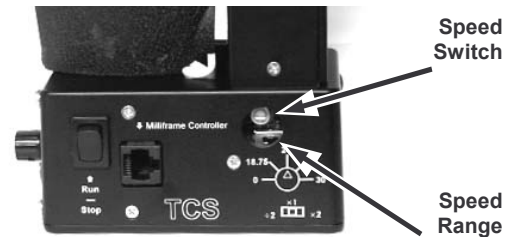


# Installing and Using the Tobin TXM-25A Crystal Motor in your Eclair ACL

## Simplified Instructions:

**1. Set the Speed Range** on the three-position slide switch, inside behind the removable white cover on the front of the motor base. The **middle** position gives normal running speeds. Use this position unless you are looking for a special speed effect. The **left** position gives speeds one half of normal. The **right** position gives speeds that are twice normal. Use something like a small screwdriver to move the actuator as desired.



**2. Set the Speed** with the small rotary switch behind the same removable cover. Be sure to use the **arrow** or color dot on the knob to indicate the desired speed; do not look at which direction the screwdriver slot is pointing as this will be incorrect and ambiguous. To change the setting, use only a small flat-blade 1/8" or 3mm screwdriver that will fit the slot. Do not use a sharp, pointed or oversize object as this will damage the plastic shaft, and replacing the switch is not covered by warranty.

**Straight up** (12:00) gives the normal USA and theatrical speed of 24 FPS (frames per second.) **Left 45°** (10:30) gives 18.75 FPS for speeding up motion. **Right 45°** (1:30) gives 25 FPS for European television. **Straight right** (3:00) gives the 30 FPS speed that is sometimes used for smoother movement in film that will only be transferred to USA video, and not projected.

These speeds will be divided by two, or multiplied by two, if the slide switch is not in the middle.

**3. Replace the cover** to protect the interior parts of the motor.

**4. Connect 12.6 volt DC power.** Polarity must be observed, with pin 1 negative (—) and pin 4 positive (+). If it is reversed, the motor will not run but should not be damaged.

**5. Running.** The camera is started and stopped with the rocker switch on the front. When you stop the camera, it will run at a very low speed until the shutter is in the viewing position, and then stop, turning the motor power completely off. (If you stop the camera instead by disconnecting the battery, or through something connected to the Accessory socket, it will stop in a random position. You likely will then need to re-open the viewing path by turning the Manual Advance knob clockwise. It will get back up to speed slowly.)

With a long scene, the motor housing will get quite warm. This is normal, and it cools quickly.

**6. Double system sound filming** requires that the live sound be recorded separately from the picture. Use a suitable recorder. At the beginning of each shot, with the camera and recorder running, use a clapper board to enable synchronizing the start points of the picture and sound in editing.

**7. Out of sync running** is indicated by the red light on the top of the motor. It is normal for it to light momentarily at the beginning of each shot. If it lights while filming, this means that crystal speed is not being maintained, and the sound will get out of sync and the picture may flicker. Depending on the battery strength, the camera may not be able to reach crystal speed if you select a speed above 37.5 FPS (18.75 on the x2 range.)

This light will show a dim red during the shutter parking sequence.

## Installation Instructions:

**1. Before you begin.** Some specialized tools are required for installing or removing the TXM-25A motor. Ones that you probably do not have in your tool box include a 3mm metric ball-end hex wrench, another 3mm wrench bent to a "Z" shape, and .050" and 1/16" (1.58mm) hex wrenches.

**2. Removal of existing motor and base.** On the existing motor, turn the threading knob so that the mirror is centered in the lens aperture, in the viewing position. Remove the motor by loosening the three screws and pulling it straight out. Do not wiggle it or you will break the flimsy miniature connector. Look at the rubber coupling that is driven by the motor shaft; an imaginary line between the two drive holes should be parallel to the camera base. If this is not the case, you will later need to adjust the stopping position of the TXM-25A.

Remove the existing base by removing the three screws. Unsolder the camera end of any electrical connections that will interfere. Put the original motor and base in storage in case you need them someday.

**3. Remove** the side and bottom covers from the TXM-25A, using a No. 2 Phillips on the bottom cover, and a No. 1 Phillips on the side cover. Save the covers and screws for re-installation. Locate the mounting hardware.

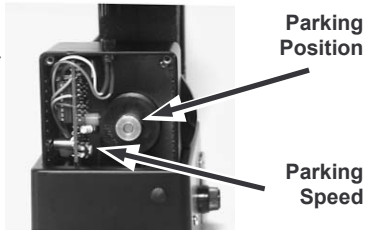
**4. Attach the TXM-25A** to the camera side by placing the camera body on top of the motor. Make sure the drive pins on the motor shaft coincide with the holes in the rubber coupling inside the camera. Make sure any electrical

wires or remaining connectors pass through the slots in the top of the motor base. Slide the camera all the way to the left, so the drive pins enter the holes in the rubber coupling and the top portion of the motor is flush against the camera's motor coupling plate. Fasten the motor to the camera's motor coupling plate with three 3mm x 6mm pan head screws, using a No. 1 Phillips screwdriver.

**5. Attach the TXM-25A** to the camera bottom. Use three 4mm x 5mm socket head screws, one on each screw. (If the threads in the camera bottom are not deep enough to tighten them fully, use three 4mm washers, one on each screw.) These screws are tricky to start and tighten because of their location, hidden by the internal motor. The ball-end hex wrench will allow you to tighten them from somewhat off to the side. A specially Z bent hex wrench will enable tightening the screw that is fully hidden behind the internal motor.

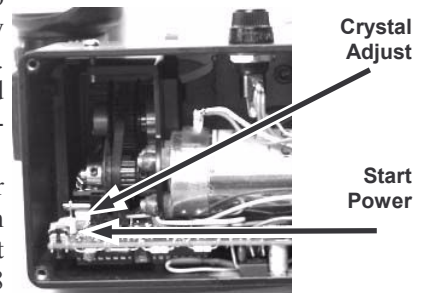
**6. Connect the power** cable to the motor and verify that it will run the camera. It may or may not stop correctly, which will be adjusted in the following steps. **Caution:** Portions of the circuitry are "live" even with the power switch turned off. Do not short out anything.

**7. Parking Speed Adjustment.** Attach the film magazine loaded with scrap film. Fabricate a small hood out of black paper and carefully place it over the Parking Lamp so no light will strike the Photocell. It will then keep running at parking speed and not stop. Turn the motor on briefly, then to off. Adjust the Parking Speed pot for a running speed of about 2 FPS (frames per second) which is 2 RPS (revolutions per second) of the pulley. Disconnect the power cable to stop the camera. Remove the black paper hood carefully.



**8. Parking Position Adjustment.** With a loaded film magazine still attached, connect power and start the camera. Turn the motor switch off. The motor should run for a few seconds at parking speed, then stop in the viewing position. If the motor does not stop in the viewing position, this is adjusted by turning the main drive pulley relative to the camera drive coupling. Take note of the position of the slot in the pulley when it stops. Turn the Manual Advance knob until the mirror is centered in the lens mount. Grab hold of something that is driven by the mechanism, such as the sprocket in the film magazine, to prevent it from shifting position. Loosen the setscrew in the pulley with the .050" or the 1/16" hex wrench (depending on the size of the installed setscrew), and turn the pulley by hand until its slot is in the normal stopping position. Tighten the setscrew. Run and stop the camera again to verify it is parking in the correct position.

**9. Start Power Adjustment.** If at 24 and 25 FPS the camera starts up running too fast and comes back down to speed, or conversely if it only gradually comes up to speed, this can be corrected by adjusting the circuit. On the lower inside face of the bottom circuit board is an adjustment marked "S". Turn it clockwise slightly to reduce the start power. Turn it counter-clockwise to increase the start power.



A technician with a high input resistance (10-11 M $\Omega$ ) DVM or VTVM can make this adjustment accurately by doing the following: With normal 12 volt supply and with magazine and film loaded, run the camera at 24 FPS. After the Sync Alarm goes out, measure the DC voltage from pin 8 (top pin) of the Milliframe socket to ground or case. Adjust pot "S" for this same voltage on the center pin, or metal frame, of pot "S." **NOTE:** Do not touch adjustment "Y" above this pot, which is for trimming the crystal frequency and thus the speeds of the motor. A frequency counter is required for this adjustment.

**10. Replace covers and plugs.** Disconnect the power and magazine. The motor bottom plate can now be re-installed. There is only one correct orientation, to not interfere with interior parts. Attach it with the four No. 6-32 flat head screws, using the No. 2 Phillips driver.

Cover the access hole for the lower 3mm attaching screw, using the black 1/4" hole plug which just pops into place from the outside.

Replace the cover on the side of the motor, using 3mm flat-head screws and the No. 1 Phillips driver.

Optionally, cover any remaining holes in the motor to minimize noise, with self-adhesive foam material.

**Complete installation** involves caulking the camera to motor gaps with sealant, after which the installation should be considered permanent.

Please give this instruction manual to the user.

## Advanced Operating Instructions:

The marked settings and speed range are shown in bold face. The actual resulting speeds are shown in normal face. Speeds with ( ) may not be available depending on the battery voltage. Speed with (( )) is possibly not available with acceptable battery voltages. Do not use more voltage than necessary as this will just cause additional heating of the components with no improvement in running.

Speed  
Range

**Actual Speed for Marked Setting Of:**

	<b>0</b>	<b>18.75</b>	<b>24</b>	<b>25</b>	<b>30</b>
<b>2</b>	0	37.5	(48)	(50)	((60))
<b>1</b>	0	18.75	24	25	30
<b>0.5</b>	0	9.375	12	12.5	15

**HMI Speeds.** For filming under 60 Hz HMI or fluorescent lights, the following speeds should give flickerless results: 12, 15, 24, 30. For filming under 50 Hz HMI or fluorescent lights, the following speeds should give flickerless results: 12.5, 25, 50. If the Sync Alarm is lit, speed is not being maintained and it is not HMI safe.

**Milliframe Controller.** The Tobin TMC2 and TMC Milliframe Controllers can be used for precision control of speed in .001 FPS increments. This will give additional HMI speeds, or permit filming from a video or computer monitor with control of the shutter bar. It will also permit double system sound filming for transfer to video, with the use of audio recorders that are not capable of speed correction on playback, such as DAT, CD, MiniDisc, or HiFi video recorders, by filming at 23.976 FPS for NTSC video. The TXM-25A has a synthesized frame pulse output to activate the electronic footage counter in the TMC2. This will give an accurate count unless running at such a high speed that the Sync Alarm light is lit, in which case the counter will register more than the actual footage used.

The Milliframe, when connected, overrides all the TXM-25A speed settings so they can be in any positions. In rare cases where a very long cable is used to the Milliframe Controller, erratic operation may result, and this might be cured by setting “0” speed on the TXM-25A speed switch.

Connect the Milliframe to the socket at the front of the TXM-25A. Power must be furnished to it for at least a few seconds, prior to starting the camera. The Videoframe Controller can also be used, for just the 23.976 and 29.970 speeds, and it does not need to be furnished power before the camera is started.

**For Technicians:**

**Power Input** is 12.6 nominal to 16.8 maximum volts DC and correct polarity must be observed.

**Milliframe Controller** connections. An RJ-12 6-conductor cable is used to connect to the Milliframe Controller. Pin 1 is +12 volts, pin 2 is open for internal crystal or grounded to select external reference, pin 3 is 100 pulse per frame 5 volt input, pin 4 is ground, pin 5 is 5 volt frame pulse output, and pin 6 is ground.

Other accessories might use all 8 positions in the socket using an RJ-45 8-conductor cable. In this case, pin 1 is +12 volts source for variable speed, 2 is +12 volts, 3 is open for crystal or grounded for external, 4 is 100 PPF input, 5 is ground, 6 is frame pulse, 7 is ground, 8 is direct 0~12 volt input with reversed sense, to the power control follower for special uses. Ideally do not use an 8 conductor cable unless pin 8 needs to be connected.

## Tobin Cinema Systems, Inc.

Website: <http://www.tobincinemasystems.com>

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