Installation and Operation Instructions:

Tobin Cinema Systems TXM-14 Crystal Motor for Eclair NPR

1. General Cautions

When power is applied to the motor, it can possibly advance one frame and stop. Avoid contact with any moving parts when applying power.

In case of circuit failure, the motor could run even with the "Run-Stop" switch turned off. If your fingers will be near film or moving parts, disconnect the power cord.

2. Installation

A. Inspect the motor front drive coupling, and the camera's rubber coupling. They should be clean and free of oil or fingerprints which could cause slippage. Clean if necessary with detergent and water, or a mild solvent such as alcohol, without getting cleaner on other camera or motor parts. The drive coupling is marked to indicate the position in which the motor will always stop at the end of a shot. Position this mark at the top.

B. Remove the camera's lens and verify that the viewing mirror is centered in the lens aperture so that neither edge of it is visible. If the mirror is not centered, turn the threading knob to make it centered.

C. Without disturbing the orientations of steps A and B, attach the camera to the motor by pushing it straight on, and lock it in place with the four retaining arms.

D. Apply power. Run the camera, with magazine and film, at 24 or 25 FPS (frames per second) for five seconds, then turn off the "Run" switch. The camera should coast down to a low speed, about 4 FPS, and then park in the viewing position. If the final mirror position is off, remove the camera and turn the threading knob so the mirror is again centered, and re-attach the camera to the motor. Replace the lens.

E. To verify that the drive coupling is not slipping, use the accessory TSC Speed Checker, or alternatively a television receiver can be used as a poor man's strobe. If you have European television, run the camera at 25 FPS and point it at the screen, while looking through the finder and preferably while tuning in a broadcast channel. A shutter bar should appear in the picture and be nearly stationary. If you have U.S. television, set the camera to 30 FPS and do the same thing. Because U.S. video is 29.970 FPS the shutter bar will drift up through the picture in about 16 seconds. If you have access to a Milliframe Controller or Videoframe Controller,

connect it and set it to 29.970 FPS and you should get a stationary shutter bar. Do not use a computer monitor as their scan rates are not standardized.

If the coupling fit is loose and slipping slowly, it can be remedied by applying and heating another 1/2" long piece of 1" shrinkable tubing; or by applying a non-slip compound. Since most rubber couplings are by now loose, one piece of shrink tubing is already applied at the factory. If it is too tight to attach the camera, remove the shrink tubing by slicing it with a knife.

3. Basic Operation

A. The camera is operated as usual. The "Sync Alarm" lights if the crystal or externally selected speed is lost. The shutter parking feature ensures that you can see through the viewfinder at all times so you are ready to film at a moment's notice. The shutter parking sequence ends with the motor power turned completely off, so there is no drain on the battery except when actually filming. (Accessories such as the Milliframe Controller will still draw power after parking, however.) If you change your mind during parking and decide to continue filming, the camera will almost instantly resume crystal speed, but another clapstick will be needed to re-establish sound sync, such as at the end of the shot.

B. Fifteen crystal speeds are available, from 10 up to 40 FPS. The TXM-14 has only HMI-safe speeds built in. Because an HMI, fluorescent or other discharge type light flashes 120 or 100 times per second (on 60 and 50 Hz current respectively) only speeds of 120 or 100 divided by a whole number are HMI safe and will give film that has even exposure from one frame to the next and does not flicker or pulsate.

- The speeds in **Bold Face** are safe for 60 Hz HMI or fluorescent lighting. In addition, you can use *10* FPS from the 50 Hz range.

- The speeds in *Italic Face* are safe for 50 Hz HMI or fluorescent lighting.

- If you are filming in daylight or under high-amperage incandescent lighting you can use any of the speeds at will.

C. To set the speed, turn the speed knob with your fingertips or a 1/4" (6mm) tip screwdriver, so the **opening or pointer** is towards the desired speed. Since the switch is recessed, the tiny hexadecimal code characters on it may help in correct aiming of the knob. The codes are 0 to 9 and A to F. (Don't confuse 6 with 9; the character bottoms are all towards the center of the knob.) Because of space limitations, the speed markings are in abbreviated form. The actual speeds are shown on page 4.

The normal speeds for double-system sound filming are 24 FPS (code 5) in North America and 25 FPS (code E) in Europe.

D. No physical harm will be done by changing speeds during filming, but remember that a speed change requires a corresponding lens aperture change.

E. The TXM-14 has both 3/8" and 1/4" tripod threads on the bottom. The larger threads will accept a tripod screw of any reasonable length but the 1/4" tripod screw must be less than 5/8" (16mm) long or it could damage the circuit board.

4. External Speed Control

A. An external speed control such as the TCS TMC-55Aa Milliframe Controller gives added flexibility for: 1. Filming at non-HMI speeds such as traditional speeds of 16, 18, 32, etc. FPS; 2. Filming at video transfer speeds such as 23.976 and 29.970 FPS for double-system sound on DAT (digital audio tape), Hi-Fi video tape, CD (compact disc), etc. that cannot be speed corrected to match the Rank/Bosch NTSC video transfer rate; and 3. Filming from video or computer monitors while giving shutter bar control. Other Aaton-compatible controllers using the WPI (formerly Amphenol) "Tiny Tim" 9-pin connector and 100 pulse per frame frequency should work also. The TXM-14 outputs a 5 V genuine frame pulse so it will support optional features such as automatic shutter re-phasing, external footage counter, and strobe sync.

If all you need are the 23.976 and 29.970 speeds, you can purchase the lower-cost TCS TVC Videoframe Controller.

B. For best results limit external speeds to the range of 10 to 40 FPS. Speeds below 10 may have exposure inconsistencies and speeds above 40 are excessive for the camera mechanism. This still gives some 30,000 possible running speeds.

C. For operational simplicity, and because the TCS accessories draw such a small amount of current, no standby switch is provided. The TMC-55Aa Milliframe Controller's CMOS circuitry draws such little power (30 mA or .03 A) that it would have to be connected for a week, 24 hours a day, to discharge the typical battery. The TVC Videoframe Controller would take three weeks.

D. When the connector is inserted into the socket, speed control is automatically transferred to the external controller. Even when using externally selected speed control, **also** set the TXM-14's speed dial to the approximate speed. This will enable reaching the externally chosen speed more quickly, without a sluggish start or overshooting the desired speed.

5. Maintenance

No routine maintenance is required.

If the fuse blows, replace it by installing a new 3 Amp GMA or 5 x 20mm, 32 volt or higher, fuse into the right side fuse holder.

There are three adjustments on the circuit board that should not be disturbed without instructions from TCS, and suitable measuring instruments.

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60 Hz HMI Speeds

Marked	Actual
12	12
13.	13.3333
15	15
17.	17.1429
20	20
24	24
30	30
40	40

50 Hz HMI Speeds

Marked	Actual
10	10
11.	11.1111
12.	12.5
14.	14.2857
16.	16.6667
20	20
25	25
33.	33.3333