

Using the TCS “TSC” Speed Checker

Introduction. You can quickly verify that your camera is running at the correct crystal speeds. This is particularly important with cameras having a friction drive coupling from the motor, such as the Eclair NPR or Arri 16-S or M. With these cameras, slippage can arise without warning and be either continuous or jerky.

Your camera's shutter is closed about half the time. So, when viewed through your camera's mirror reflex finder, about half of the ten LED's (light emitting diodes) in the rotating circular pattern can be seen. A stationary light/dark pattern indicates that the speed is correct. A moving pattern indicates the camera is drifting out of sync. (The orientation of the pattern does not matter, and it will probably shift every time you start the camera.)

Drifting clockwise means the camera is slow; counterclockwise means the camera is fast. One LED's worth of movement indicates a sync error of 1/10 of a frame. A drift of 5/10 frame (five LED's) in the time period of your longest possible shot length could cause a noticeable loss of sound sync. Some fluctuation in brightness of the first and last lights is normal, from camera phase jitter.

For cameras without a mirror shutter, the lens and pressure plate can be removed so you can look through the lens opening and running shutter towards the Speed Checker. Alternatively, nine of the LED's can be covered up with black paper and the remaining one shined on to sprocket teeth or the pulldown claw. Although the flashes are not as short as with a strobe, giving some motion blur, any significant drift can be clearly seen.

WARNING: Flashing lights have been known to cause epileptic fits in susceptible people.

Battery Installation. A battery can be used until the LED's become noticeably dimmer than when new. Do not leave a dead battery in place as it may leak a corrosive fluid. Remove the four lid screws with a No. 2 Phillips screwdriver. Pull out the battery. Remove the battery snaps only by pulling on the snap assembly itself, never by pulling on the thin wires, which will break.

Install the battery snap on the fresh battery, which should be a 9 volt alkaline type, and slip it down into the recess provided, with the battery snap down in its notch in the corner of the circuit board. Replace the lid and lid screws.

Estimated battery life for operation without an accessory is 2 hours for zinc-carbon, 12 hours for alkaline, and 34 hours for lithium type batteries.

Or, Use Wall Adapter. Use the adapter furnished or equivalent, 12 volts DC, tip negative. Inserting the plug disconnects the internal battery. Use of the wall adapter is preferred when also using the Milliframe or Videoframe Controller.

On & Off Switch operation is self-explanatory.

Speed Selection. The 8-position rotary switch is recessed to prevent damage or accidental actuation. Turn it with a small flat-blade screwdriver. Note that the molded-in arrow or pointer must be aimed towards the desired speed; do not go by the screwdriver slot or the speed will be incorrect and ambiguous. All of the speeds are 60 Hz HMI compatible ones as used with modern cameras and techniques. The speeds include 12, 15, 20, 24, 30, 40 and 60 FPS. For use with an accessory such as the Milliframe or Videoframe Controller, switch to the “MC” position.

Milliframe Controller. To use it or the Videoframe Controller, connect it with a DE-9 male to male cable. Turn the speed switch on the TSC to “MC.” To conserve the small internal battery, the external accessory receives power only when the power switch is turned on. In the case of the Milliframe Controller, it takes a few seconds after being turned on to stabilize at the set speed. So turn it on at least a few seconds before starting the camera.

The TVC and TMC-55Aa are designed to be used on 9 volts or more, so either use a very fresh battery or the wall adapter for best results.

The MC socket is wired as follows: pin 3 is 100 5 volt logic pulses per frame, pins 5 and 9 and the metal shell are negative ground, and pin 6 is +9 or +12 volts switched power from the battery or adapter. Other pins are not used. Since the TSC is all electronic with no moving parts, it can accept signals from future devices of up to 10,000 FPS.

Slipping Sync. If your Eclair NPR, or Arri 16-S or M, is slipping from correct sync with a crystal motor, a likely cause is a rubber coupling that has stretched out of tight fit by age and use. An expedient remedy is to cut a short piece of heat-shrinkable tubing, 3/8" diameter for the Arri and 1" for the NPR, slip it over the motor's drive coupling, and heat it to a tight fit.

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tubing, 3/8" diameter for the Arri and 1" for the NPK, slip it over the motor's drive coupling, and heat it to a tight fit.

If this does not work, or for other camera models, refer to a factory authorized service technician for speed calibration. This normally entails attaching a frequency counter to the appropriate point in the crystal oscillator circuit, and adjusting a trimmer capacitor for the correct reading. Some early equipment may not have an adjustment, and correction must be done by changing component values. The counter itself should be ovenized and recently calibrated, and the probe must go to the right place to avoid detuning the circuit and getting a false reading.

The TSC itself has a calibration adjustment which must not be disturbed except by properly equipped and informed technicians.

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