Using the TCS TXM-24
Crystal Control for Bolex EBM-EL-ESM

Abbreviated Instructions

1. Plug the crystal into the camera.
2. Switch camera to “SYNC” or “CRYS.”
3. Switch crystal to the desired speed.
4. Film away, ensuring that the “Alarm” stays dark.

The following gives additional detail for advanced and special uses:

Applications

The TXM-24 is used for double-system sound filming with the Bolex EBM and EL cameras, and the ESM motor used with spring-wind cameras.

The TXM-24 gives the traditional sound speeds of 24 FPS (frames per second) used in North America, and 25 FPS as standard in Europe and much of the world. The audio recorder, such as a Nagra or cassette, must be equipped with a crystal sync generator. This will record a pilot signal (a timing or speed reference) on the recorder’s pilot or spare audio track. (Suitable crystal sync generators are also manufactured by TCS.) This tape is then resolved (i.e., transferred in sync) to 16mm perforated magnetic film, which runs at exactly the same speed as the picture, for editing.

It is also possible to have the sound on DAT (digital audio tape,) MiniDisc, CD (compact disk,) or on Hi-Fi video tape such as 8mm, Hi-8, VHS, etc. Since these formats automatically record a control track that is locked to the same crystal on playback, acceptable sync can usually be maintained by simply re-recording to magnetic film without any special equipment. The magnetic film recorder is run at the same speed as the filming rate (24 or 25) preferably locked to a crystal rather than the power line (mains) frequency, which can vary somewhat. Since general purpose consumer sound equipment is not adjusted as accurately as equipment intended for sync sound use, the best sync will be obtained by playing the digital or Hi-Fi tape back on the same piece of equipment as was used in the field. The picture and sound rolls can then be edited to make film prints, or interlocked together for transfer to video.

For filming under conventional HMI lights, fluorescent lights, or discharge-type street lights the question of HMI compatibility arises. 24 FPS is HMI safe for lights operated on 60 Hz power. 25 FPS is safe for lights operated on 50 Hz power. Of course, when filming under daylight or high-amperage tungsten, any speed can be used at will anywhere in the world.

Connection and Operation

For the **EL** and **ESM**, simply plug the TXM-24 7-pin male Tuchel plug into the socket provided on the camera or motor. With the **ESM**, be sure the <u>camera</u> speed governor is set to 64 FPS.

Since the **EBM** has only a single 7-pin socket, plug the TXM-24’s cable into the camera. Plug the switched power cable into the 7-pin female “**EBM Power**” socket on the TXM-24. However, if you are using the Power Grip with its internal battery, just plug the TXM-24 into the 7-pin female socket on the back of the Power Grip.

For crystal sync sound filming, you must switch the camera to “**SYNC**” or “**CRYS**” (depending on the model.) Run the camera. The “**Sync Alarm**” should initially light, and then go out. A bright light

indicates total sync failure such as from a stopped or defective camera, bad cable, or damaged quartz crystal. If it flashes, then sync is not being maintained and the camera is running at the wrong speed. The rapidity of the flashing is proportional to the speed error. This could be caused by a film jam, weak battery, defective camera or cable, or most often by the camera dial not being at the proper setting.

You can preview this effect by switching the camera to a specific speed, such as 18 or 32. The crystal circuitry senses the errors but has no actual control over the camera in these positions, and the "Alarm" light will flash rapidly.

☞ ***When you are finished testing, remember to switch the camera back.***

For conventional filming, use 24 FPS in North America and 25 FPS in Europe. Set 24 FPS by moving the switch left to the "24" position. For "25" FPS, move the switch right. At the beginning of each shot, use a clapstick that can be seen by the running camera and heard by the running recorder's microphone, to establish a starting point. To minimize confusion later, also write the scene and take number on the clapstick, and announce it verbally. These steps should eliminate guesswork in proper synchronization. Film editing and sound mixing steps are beyond the scope of these instructions and you should refer to the books and courses on the subject.

Your Bolex is not a self-blimped quiet camera, so a technique involving a blimp or barney, filming at a distance or through a window, the use of directional or lavalier microphones, etc. may be called for. If you are filming a music video with the performers syncing to playback, or recording audio that will be replaced later, then camera noise is not a problem.

Other Information

There are no user adjustments or user-replaceable parts inside the TXM-24. Refer all servicing to qualified personnel.

The crystal can be recalibrated if necessary by connecting a frequency counter to the test point which is pin 9 of the CD4060 IC, and to ground. Adjust the trimmer capacitor for 6144.000 kHz ±20 Hz, while connected to a camera receiving normal 12 volts DC. If you do not have a recently certified frequency counter, this adjustment is best left alone.

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