

Operating Instructions

Tobin Video Transfer (TVT) Dual-8 ME “Mainstream E” Emulsion Scan Telecine

Cautionary Notes:

1. If working near potentially moving parts, first turn off the power with the rear switch.
2. The light emitter should not be looked at directly as it is very bright.

Basic Operation

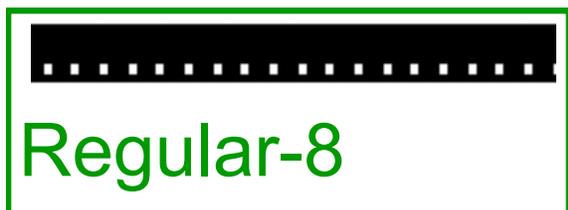
Turn on the power with the switch on the right rear of the TVT. See page 8 for parts identification.

Run Forward. Check that there are no hairs or dirt visible in the picture on the underscanned video monitor. If there are any, stop, swing open the film gate, and brush or blow it out. Close the film gate.



Check that the film format is correct for the present TVT setup. Basically:

- Your TVT is set for Super-8 film when the Claw lever is in the Super-8 S8 (upper) position and the 1/2" (12.7mm) supply reel spindle is installed.
- Your TVT is set for Regular 8mm film when the Claw lever is in the Regular-8 R8 (lower) position and the 5/16" (8mm) supply reel spindle is installed.



The film will not advance through the gate if the Claw setting is wrong. If the setup is wrong, change to the other TVT setup. Besides the basic Claw lever setting there are optical adjustments needed, see pages 3 and 4.

“NTSC” and “PAL” designations on the badge in the lower left of the front panel show the video standard for which the model is made. NTSC is used in the USA, PAL is used in Europe.

The TVT has easy automatic threading. This sprocketless design prevents the film damage that could otherwise occur if a bad splice sticks in the film gate and film sprockets continue to drag the film through. Note that the Claw lever must be correctly set, or the film will fold into “concertina creases” in the upper film guide. Be sure that the leader has a bevel trimmed from the beginning of the unperforated edge, about 2 frames in total length and maximum 1/16" (1.5mm) inwards. Threading is done as follows:

1. Place the full film reel on the Supply (right-hand) reel spindle. Ensure that the film leader is flat or has only a gentle natural curl from being wound on the outside of a 400' or 600' reel, and is cut straight across, in between perforations, with a bevel as mentioned. The film’s perforations should be towards you, with the end hanging on the right.
2. Start the TVT running forward.

3. Move the Film Threading Lever ① fully downwards in the large arc shown, and feed the beginning of the film leader between the two metal guide rollers ② until the rubber feed roller pulls film from the supply reel. (See Figure A at right.)
4. Allow about six inches (15 cm) of the film leader to enter the TVT, or until you hear the clicking of the pulldown claw engaging the film. This should take about two seconds.
5. Then release the Film Threading Lever gently to its original position. The film will now naturally pass by the left side of the attached roller, to give additional vibration-absorbing action. NOTE: Failure to release the Lever soon enough may cause a film jam.
6. When the film leader emerges from the lower sprung film guide, lead it around the two guide rollers towards the Take-up (left-hand) spindle. Let the leader extend about a foot (30 cm) past the Take-up reel spindle.
7. Stop the TVT. When the Take-up spindle stops turning, mount the take-up reel on it. Attach the leader to the hub of the take-up reel, and turn the reel clockwise a couple of turns.

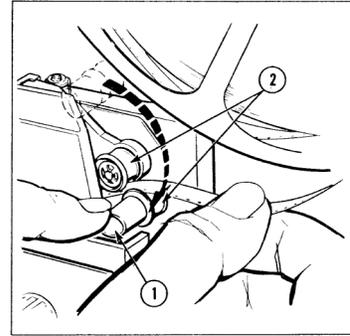


Figure A. Autoload Threading

NOTE: If tension becomes excessive when running from a small 50 foot (15 m) reel, or an old style small center hub reel, remove the reel and place the anti-friction washer provided on the Supply reel shaft before re-mounting the reel. This will reduce the drag, by the Supply reel motor not having to be turned by the pull of the film.

Switch to “Forward” to preview the film. It should be right way up (people’s heads and the sky at the top). The frameline (the dividing line between pictures on the film) should not be visible; if it is, adjust the Framer knob until it is not seen. (See paragraph 6 on page 4.) The film need not be running to make the adjustment, but ensure the frame is in its rest position and not in the middle of a pulldown cycle. Loosen the gate thumbnut as needed to make the adjustment, then re-tighten.

Switch to “Reverse” and run until the picture is all back on the supply reel and there is about 1 foot (.3m) of leader film between the supply reel and the film gate, then switch to “Stop.” Start the video recorder. Switch the TVT to “Forward” and you will be recording the film on video.

NOTE: Reverse running does not have as many sprung vibration-absorbing rollers on the feeding side, as when running forward. If the tension is too great, help the take-up reel by turning it counter-clockwise by hand, to keep the film slack instead of taut.

At the end of the film, switch to “Stop” and stop the recorder. Attach the end of the film straight across to the supply reel, without going through the rollers and gate, and turn the reel a couple of turns counter-clockwise. Switch the Rewind “On” and when the film is fully rewound turn the Rewind switch “Off” immediately. Do not stick your finger into the reel spokes or grab the edge of a plastic reel while it is spinning, as this may cause injury. Remove the supply reel after it stops, and you are now ready to transfer the next reel.

One flickerless speed is included: approximately 18 FPS (frames per second) for most home movies. The actual speeds are 17.126 FPS for NTSC video models, and 16-2/3 FPS for PAL video. On special request, NTSC machines can be built with 19.98 FPS speed which is fine for super-8 but may be too fast for old 16 FPS regular-8. There is no speed switch.

Film Format Changeover

1. Claw Change: First, Open the film gate to prevent damage from the claw hitting the edge of the clearance slot in the pressure plate. Move the Claw lever (below the mechanism) all the way up to S8 to center it for super-8 film. Move the claw lever all the way down to R8 to center it for regular-8 film. (Step 2 is not used with the ME version.)

Note: the following step uses the **1/16"** Allen hex key.

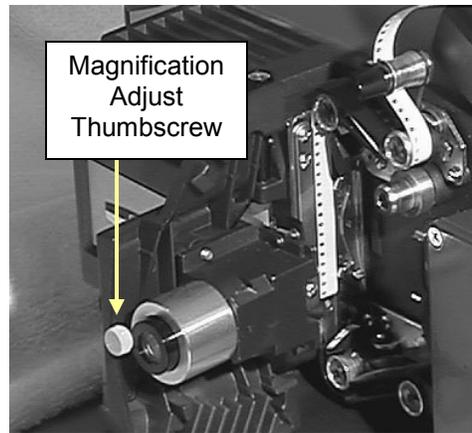
3. Feed Reel Spindle Change: The right-hand reel spindle is loosened with the Allen key so you can replace it with the other size. S8 film uses the 1/2" (12.7mm) spindle and R8 film reels have the 5/16" (8mm) size hole. (The "wrong" spindle can be installed to suit film that is wound on the wrong type non-standard reel.)

4. Magnification Change: The effects of this and the following adjustments should be judged on your underscanned monitor. The lens can be removed by fully unscrewing the Magnification adjusting thumbscrew. An internal spring presses the lens against the adjustment.

For **Super-8** film, the end of the lens with the retaining ring should face the film. For regular-8 film, the end of the lens with the retaining ring should face the camera. For Super-8, adjust the thumbscrew so the right end of the lens is protruding from the lens holder by about .2 inches or about 5mm.

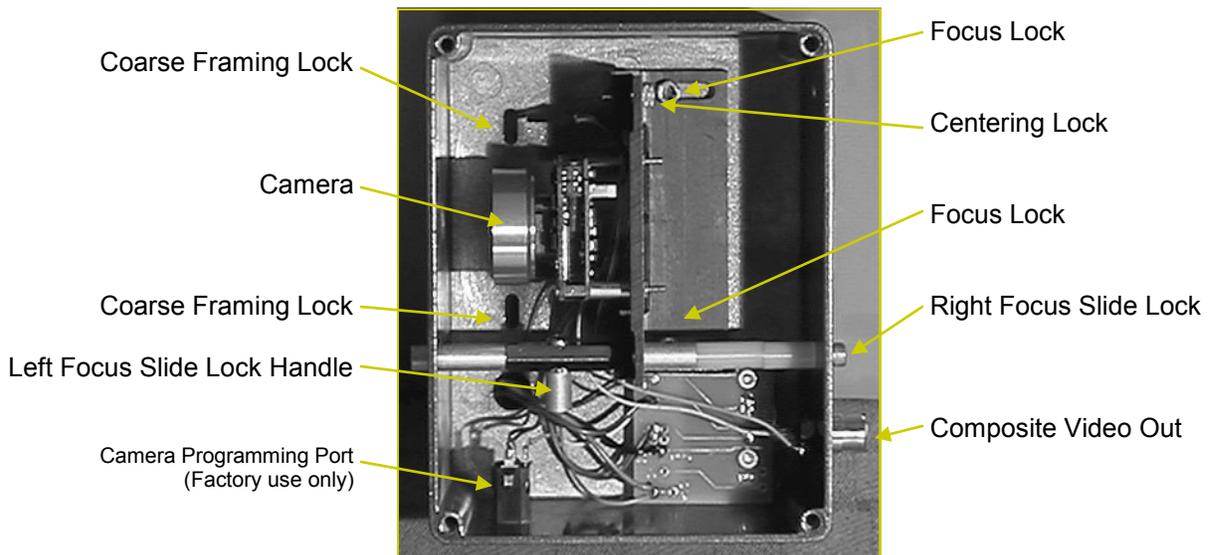
For **Regular 8**, reverse the lens end for end so the retaining ring is on the left, and slide the lens so the right end extends only about .12 inches or about 3mm past the right side of the lens holder.

(When adjusting the TVT to match the aperture of a particular film camera, this setting can be modified. Moving the lens to the left will further magnify the film (zoom in); moving it right will reduce the size (zoom out). If you "zoom in" too much you will cut off people's heads and feet more often. If you "zoom out" too much you will have to change the Framing Adjustment more frequently while working, and you are more likely to see and deal with hairs and dirt around the edges of the camera's filming aperture.) In the picture the film gate is swung open for clarity.



Note: the following steps use the **7/64"** Allen hex driver, with camera cover removed with a #2 Phillips screwdriver, and you can best see on the monitor what is happening if the room lights are dim. The ball end of the 7/64" driver must be used in order to reach the lower Focus Lock screw at an angle.

5. Centering Change: Run the film to be copied to a few feet or more past the end of the head leader. Pick a spot with lots of fine detail or that is grainy, for easier focusing (below). If the film frame is in the middle of a pulldown cycle, turn the Manual Advance knob counter-clockwise so the film



advances once and then is stationary. (Don't turn clockwise or the frameline will not be in the same place as when running forward.) Loosen the Left hand part of the Focus Slide a turn or two of the handle. Loosen the Right part of the Focus Slide by about a turn. Loosen the Centering Lock Screw on the rear of the camera plate by 1/8 of a turn, and slide the camera plate in or out on the elongated holes to center the image. (Do not disturb the 2 small screws that mount the camera module to the metal plate.) Tighten the Centering Lock Screw. Tighten the right part of the Focus Slide. Tighten the left part of the Focus Slide.

6. Framing Adjustment: The Framer knob adjusts the framing of the image, so the dividing line between film pictures does not show. If there is not enough range, you can loosen the two Coarse Framing lock screws inside the camera case and move the camera box up or down, then re-tighten.

7. Focus Adjustment. Loosen the two Focus Lock screws slightly. Manually slide the camera plate left and right delicately to find the best focus. Re-tighten the two Focus Lock screws.

Check and re-adjust if necessary the Magnification, Centering and Framing settings as changing the focus may have altered them slightly.

Installation

Connect the TVT to a suitable video recorder. This is often a Mini-DV (digital video) or else DVD (digital video/versatile disc) recorder, or less commonly these days a VHS (video home system) machine. There are two video output jacks on the front of the machine. The S-Video jack is on the main panel, and the RCA jack is on the Right side of the camera box. Both can be used at the same time if desired:

- The S-Video ("Separate"-video) Y/C output may give a cleaner video signal in many cases, as the luminance (brightness or Y) and chrominance (color or C) signals are sent through separate wires and will not interfere with each other, and thus not cause odd artifacts to appear in the picture. This preferred connection is with the Mini-DIN 4-pin cable.

- The conventional video output is used in case the recorder lacks an S-Video input. The jack is an RCA phono type, so use an RCA to BNC cable or adapter (not included) to connect to commercial video equipment. Use the included RCA to RCA phono type cable or adapter to connect to the Yellow input jack on consumer equipment.

To connect to a computer for editing, you can feed directly into the Video Input jack on the high speed computer's video card. If this is not present, you can use a camcorder with analog input and pass-through feature, or a box made by Canopus, to convert the video signal to a computer signal.

Plug the TVT into a source of 100 to 240 volts AC (alternating current) at 50 or 60 Hz (Hertz, or cycles per second.) For safety the third wire should be grounded (earthed.) Turning on the unit will cause the light source to light up, and for video to be output.

Monitoring

A color video monitor should be used to help you best oversee the transfer operation. We recommend that the picture monitor be connected to the output of the recorder, so the tape or disc playback can be spot-checked for quality. We also suggest the use of an "Underscan Monitor" which enables the entire video signal to be seen by the operator. Such a monitor can be recognized by an Underscan-Normal switch. (In the underscan position, the active video area is bordered with black.)

This is because ordinary monitors and TV sets have varying degrees of "overscan." The picture is larger than the picture tube, so the edges are cut off. The amount of underscan is not well standardized, may not be centered, may be out of adjustment, and may hide defects that could be seen on a different TV set. For example, the film may be out of frame so that the frameline is visible on some receivers but not others. Or, a piece of lint may be lodged on the edge of the aperture and working its way into the frame. To guarantee that the frameline or hairs will not be visible to anyone, no matter how

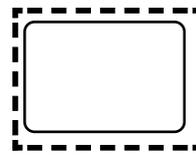
their TV set may be adjusted, the transfer process should be watched with an underscan monitor so the entire video signal can be seen. There can be small artifacts on the extreme edges, such as dirt specks stuck to the aperture, which may not be a serious problem as the customer will probably not see the entire video frame on his TV set.

The Underscan monitor is necessary when correctly adjusting the magnification, centering, framing and focus when changing over between the S8 and the R8 settings.

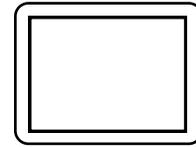
When demonstrating the process or results to the public, the monitor should be switched back to the Normal position to prevent misunderstandings or long explanations.

If an Underscan monitor is not available, you can manage with one having Pulse Cross (Pulse Delay.) This puts the corners of the picture in the middle of the screen. It is possible to use this function to check for framing and gate hairs although it is less convenient.

Some consumer flat-panel TV sets are now being made with Native Mode (Toshiba's name for it) or equivalent, and show the entire video signal without overscanning and losing part of the picture. These can be used in place of an Underscan monitor.



Conventional TV
or Monitor Cuts
Off Picture



Underscanned
Monitor Shows
All The Video So
No Surprises

Other Needs

Film will be received from the public in various states of disrepair, with bad splices, winding turned over on the reel, being mounted on the wrong type reel or the wrong way out, no leaders, etc. and a facility must be provided for making the footage ready for transfer. This requires at the minimum a pair of film rewinds, with adapters for regular-8 and super-8 reels, a supply of film leader and empty reels, a film splicer, and a way of cleaning excess dirt off the film. Ideally there will be a light box for looking through the film, and a light above the editing bench to reflect light off the film.

Refer to the first section of these instructions for a description of how the film should be wound on the reel. There should be 4 feet of leader on the start for proper threading of the TVT, and enough leader on the end to thread the film cleaning device. Torn film sprocket holes and crooked splices should be removed to prevent transfer problems.

Small rolls should be spliced together for efficient transfer. A properly made cement splice, using fresh cement, is preferred. The smoothest transit of splices occurs when you have made a beveled splice using an (unfortunately discontinued) Agfa or Bolex splicer, where the total thickness at the splice is about the same as unspliced film. (Fuji Single-8 and K-Mart Focal film was on polyester base and must be tape spliced.) When making tape splices, ensure that the sprocket holes are not covered up and the tape is on straight, on both sides of the film.

We suggest using 400 foot (122 meter) reels, and cans or 7" size white 1/4" audio tape boxes. Usually if 7 small 50' rolls of regular-8 film, or 8 small 50' rolls of super-8 film, is wound on each reel, this will enable two of the reels to fit on each 1 hour tape or disc with minimum waste and no need for time-consuming tape editing or overlaps. Mark the leader on the head (beginning) of the reel with the customer's name or job number, and the reel number, to avoid mixups. Leader with a matte finish can be written on with pencil, while shiny leader can be marked with a Sharpie or India ink. Ensure that that the cleaning step does not remove the reel identification. Storage cans should be ventilated for slight air circulation, to prevent film deterioration from "vinegar syndrome." Advise the customer to keep his film in a cool, dry, dark place to prevent fungus growth. You want the film to be in good condition so you can transfer it again when the next super generation of video equipment formats makes the present transfer obsolete. :-)

NOTE: The TVT has the super-8 claw position, above the gate, when running both S8 and R8 films. Such mechanisms are fussy about splices, compared to regular-8 only ones with the claw below

the gate, as the flexible film is being pushed rather than pulled. If your cement splices cause excessive jamming in the film gate, change the direction of splicing by winding the film right to left on the bench while splicing, instead of left to right, so you are scraping the outgoing film instead of the incoming one. Having the splice accordingly lap the other way (so the sharp leading edge of the thick splice rubs against the mechanism's pressure plate instead of hitting the bottom of the minimally undercut aperture plate opening) will give more reliable running.

After each reel is spliced and repaired, it is rewound through the film cleaner device on to the proper reel, which restores the reel to being heads (start) out instead of tails (foot or end) out, and sent to the transfer room. **Note:** When using a liquid cleaner, view the rewinding film by reflected light to make sure it is dry again before it winds up, or else the film may dry with "shoreline" marks on it. You can wind quite fast if not using an excessive amount of fluid.

Important note on lubrication: Some film types are not lubricated in processing and will give an unsteady image and noisy running until lubricated. This includes the current Ektachrome 64T and 100D film as well as some private brand films made by other manufacturers, and arises because of laxity or environmental concerns by the lab. The cleaning fluid should have a small amount of wax dissolved in it to provide lubrication for smooth transport through the TVT, or through the customer's projector. A suggested amount is a lump of candle wax or beeswax the size of a pea ground up and dissolved in a pint (half litre) of solvent. Cleaning solvents that are widely used include methyl chloroform (*toxic fumes*), perchloroethylene (dry cleaning fluid) (*toxic fumes*), Freon TF (*ozone depleting*), or 99% isopropanol (isopropyl alcohol) (*flammable*). There are also commercially mixed film cleaners with lubricant. Cleaning must take place in a ventilated area. Do not use too much wax, or it will not fully dry and will act like a glue rather than a lubricant.

Some users have adopted a modified means of lubrication. They spray Pledge Beeswax furniture polish on to a rag, and wind the film through it while still damp, with the emulsion and base sides towards the cloth.

Exposure and Color Correction

The automatic exposure correction uses Center-Weighted Averaging sensing, for good results from a variety of original moderate over- and under-exposure conditions.

If your TVT was ordered with AWB (Automatic White Balance,) the color balance is continuously adjusted so the picture keeps a good range of color, averaging to grey. This will however sometimes give odd color effects with good film. The camera module does not have a switch for turning this function on and off, and this must be done by returning the TVT to TCS and having the camera DSP (digital signal processing) re-programmed. The sticker on the camera cover will indicate whether the TVT also has AWB.

Estimating Film Length

The Mainstream E version omits the footage counter as a cost and complexity saving measure. You can however estimate the footage or meter count from the running time of the picture on the tape or disc. Multiply the running time in minutes by the appropriate number below:

For **NTSC** machines with normal 17.126 FPS speed, 12.844 feet of regular-8 film goes through per minute. For super-8 film, 14.274 feet of film goes through per minute.

For **NTSC** machines with the optional higher speed 19.98 FPS rate, 14.985 feet of regular-8 film goes through per minute. For super-8 film, 16.653 feet of film goes through per minute.

For **PAL** machines running at 16-2/3 FPS speed, 12.500 feet (3.810 meters) of regular-8 film goes through per minute. For super-8 film, 13.892 feet (4.234 meters) of film goes through per minute.

Other Information

Routine maintenance:

- After long use, perhaps hundreds of hours of running, the claw pivot and cams may need greasing. Instructions for this are posted in the Instruction Manual section of the website, or will be furnished on request. The pulldown claw, shuttle and cams may also need adjustment or replacing.

Service adjustments:

- After long use, the white balance of the LED and camera module could change, which is not important if using the AWB as it should adjust itself. To reset the white balance with fixed white balance setting, the TVT must be returned to TCS for DSP programming.
- In case of replacing the timing belt, it will be necessary to reset the Shutter Phase in order for the automatic exposure to work smoothly, and not have blended film frames, or the edge of the shutter blade showing, depending on the exact model. The starting point for adjustment is so that when the claw has entered a perforation but is not quite started pulling the film down to the next one, the slot in the encoder disc (on the motor shaft) is centered on the opto-interrupter module. You may need to turn the disc counter-clockwise a bit from this initial setting.
- In case of odd symptoms, first check the output voltage of the switching power supply module. This should be 18 or 24 volts DC, $\pm 5\%$ depending on the exact model. The voltage should change little no matter what settings are made to the operating controls. The power supply voltage may sag momentarily while the drive motor starts running.
- If dust accumulates on the optics or light source, it should be removed with a clean camel's hair brush or air blower. Fingerprints must be removed immediately from the lens with lens cleaner and lens tissue, following the instructions included with them. There should be no need to dismantle the light source module.

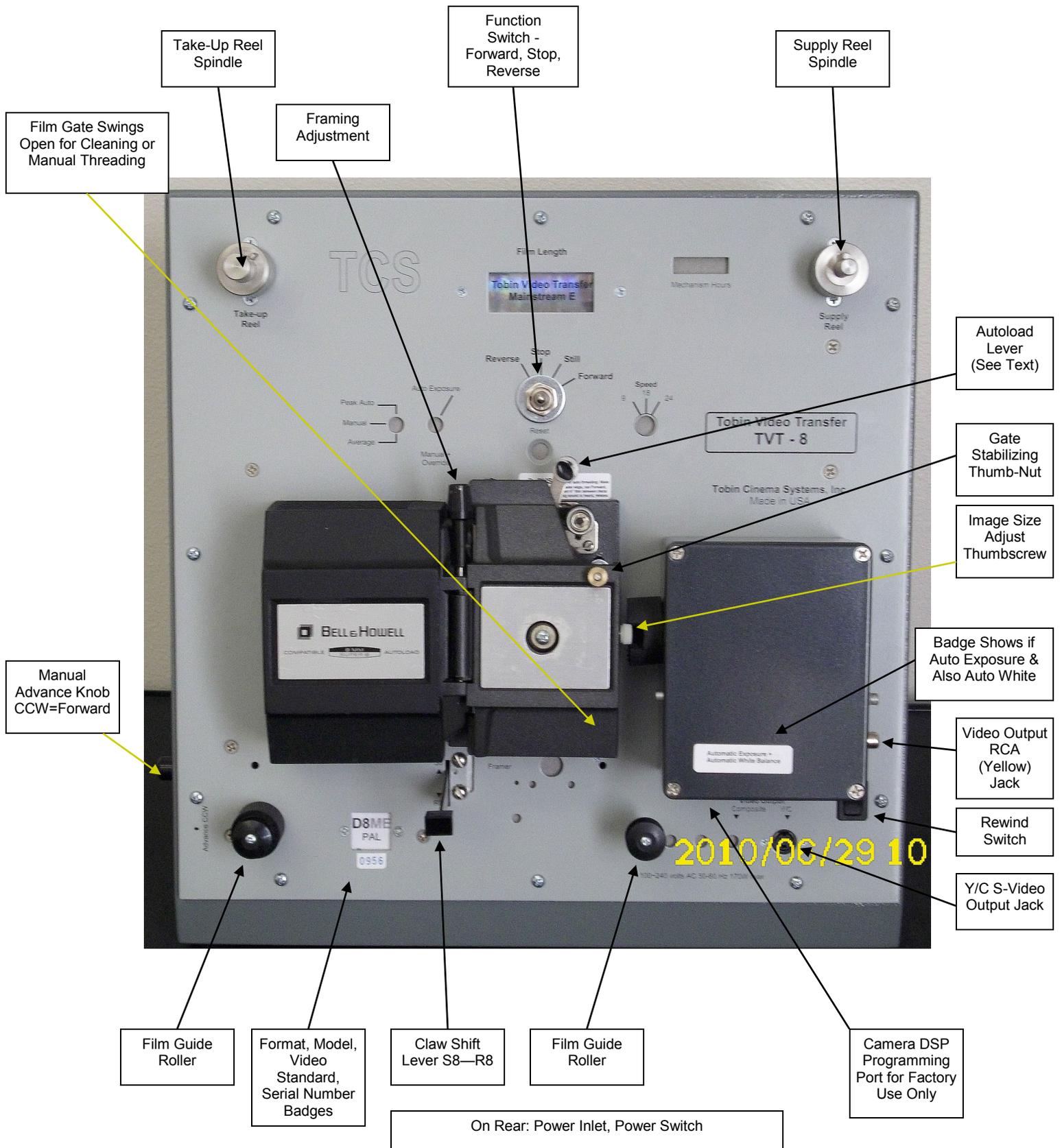
Suggested Sources of Supplies

<http://www.urbanskifilm.com>

Tobin Cinema Systems, Inc.

<http://www.urbanskifilm.com>

TVT-D8 Mainstream E.pub rev 6-29-10



Tobin Cinema Systems, Inc. Dual-8 Mainstream E