

Tobin TVT-8PHD Progressive Scan HD High Definition Telecine

Cautionary Notes:

1. The three motors are electronically switched and circuit failure could cause them to run prematurely. 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 can be very bright.

Basic Operation

NOTE: The TVT-8PHD models are computer dependent. You must have a computer and computer monitor connected in order to see and record the picture. The computer must be the correct type with suitable software already installed. The software and driver installation and use instructions are given on page 4.

Turn on the power with the switch on the right rear of the TVT. Ensure the Exposure knob is advanced somewhat, to illuminate the film.

Click on the StCamSWare program icon to start it. Starting will occur if the camera is connected and the USB2 is fast enough.

Note: see page 10 for identification of the items on the front panel. The sprocketed version is shown, sprocketless is similar.

Switch the unit to “Still” and note that there are no hairs or lint visible in the picture on the monitor. If there are any, swing open the film gate and brush or blow out the hairs. (If the screen is dark, rotate the Manual Advance knob a partial turn to open the shutter.) Switch back to “Stop” and close the film gate.



Check that the film format is correct for the model TVT-8 machine that you have:

- **Super-8** machines are labeled “S8PHD” on the front badge and are for super-8 film. Super-8 film has small sprocket holes and normally comes on a reel with a 1/2" (12.7mm) diameter center hole.

- **Regular-8** machines are labeled “R8PHD” on the front badge and are for regular-8 film. Regular-8 film has larger sprocket holes and normally comes on a reel with a 5/16" (8mm) diameter center hole.



If the film is the wrong type, change to the other model of TVT machine. However, if your machine is **Dual-8**, see pages 7, 8 and 9 for changeover instructions.

Place the full reel of film on the right-hand “Supply Reel” spindle, matching up the slots in the reel hub with the spokes in the reel spindle. If the reel is correctly prepared, the perforations (sprocket holes) in the film will be towards you, with the emulsion side (the side with the picture) facing to the right, while the film is hanging down from the right-hand side of the reel. There should be about 4 feet (1.25m) of leader before the first picture. If any of this is not the case, return the film reel to the preparation department for correction.

If the leading edge of the film is mangled, trim it straight across in between perforations and make little bevels on the corners with scissors, if the film preparation department hasn’t already done so. If it is bent, flatten it.

Automatic Threading for Dual-8 and Sprocketless Machines:

1. 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.)
2. 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.
3. 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.
- 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.
 - 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.

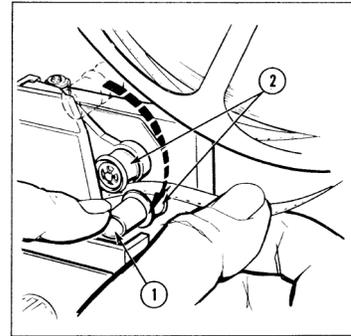


Figure A. Autoload Threading

For Both Types:

Switch to “Still.” (You can carefully apply a braking force to the takeup reel to slow down its spin, without sticking your fingers in the spokes.) Lead the film around the two rollers or plastic guides and attach to the takeup reel hub, turning the reel clockwise a couple of turns.

Turn the Manual Advance knob counter-clockwise a few turns to ensure that the film advances intermittently through the film gate. 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” lever or knob, until it is not seen.

Note that the camera is continuously triggered by the TVT at the selected frame rate. This is so you can see the image on the computer monitor and make any needed adjustments to exposure, framing, etc. The actual recording is started and stopped with the computer program.

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.” Push the “Reset” button to zero the footage counter. Note that in Reverse the image may have frame blending or some flicker, depending on camera settings; this is normal as the shutter is correctly synchronized only in Forward.

NOTE: You have a choice of running speeds, either 9, 18 or 24 FPS. If you select a faster speed than the computer can support, you may experience skipped, black or flickering frames in the file. Also be sure the program is set for Triggered mode, and not Free Run. You can only record for 30 minutes per file so recording at a high frame rate will enable a full reel to fit in one file. See Note on AVI Recording below.

Note that the **final running time** of the file will **not** be affected by the running speed of the film when transferring, as one frame of film will still result in one frame of video. Film that was photographed originally at say 16 or 18 FPS will still be 16p or 18p in the file, and will need additional processing in the computer to be viewed at the correct video rate, such as 24p or 30p for a DVD or 50i/60i for video tape.

Refer to the Note on AVI Recording instructions below for recording a file from the film. Switch the TVT to “Forward” and you will now be recording the film on the computer.

The film should be inspected, repaired, cleaned and lubricated before it comes to you for transfer. In case a bad splice or multiple damaged perforations causes loss of the film loops with a sprocketed model, this will cause a chattering noise and the picture will start jumping up and down. Press the “Push” bar sharply to reset the loops. If this doesn’t work, turn to “Stop” and also stop the computer recording. Turn the Ratcheting Sprockets to reset the film loops to midway between the clear plastic guide rails so they are not touching, both above and below the film gate. Then resume the transfer.

At the end of the film, switch to “Stop” and stop recording. Write down the film length count for billing purposes, if your company charges by the foot or meter. Attach the end of the film straight across to the supply reel, without going through the sprockets and gate, and turn the reel a couple of turns counter-clockwise. Switch the Rewind “On” and monitor closely because the film rewinding is very fast, and when the film is fully rewound turn the Rewind switch “Off” immediately. Remove the supply reel after it stops, and you are now ready to transfer the next reel.

Note on AVI Recording

When you click the Record Video tab, you then go to a screen where you select the location and file name of the video. After you Enter this, you will go to the next page where you select Compression Mode and Recording Time.

Normally you select **Motion JPEG** compression at 75 (default) quality level.

The lower slider will then allow you to pick recording time. You can pick anything up to 30 minutes per file. At a typical 18 FPS speed this will record up to 450 feet of super-8, or 405 feet of regular-8 per file. At 24 FPS

this will record up to 600 feet of super-8 or 540 feet of regular-8. If the exact length is not known, guess on the high side and you can stop recording early by exiting the program.

Uncompressed recording can also be used for very short rolls of up to 910 frames, or 12 feet of super-8 or 11 feet of regular 8. This is the limit of the program and cannot be increased, to our knowledge.

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. :-)

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 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 is wound up, or else the film may dry with "shoreline" marks on it. You can wind quite fast if not using an excessive amount of solvent.

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 films as well as some private brand films made by other manufacturers. 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.

TVT Installation

Plug the TVT-8 into a source of 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 footage counter to light up. Sprocketless machines can be used only on the specified voltage, 120 or 230, to suit the AC powered reverse/rewind reel motor. Using the 230 volt motor on 120 volts will give inadequate power and speed. Attempting to use the 120 volt motor on 230 volts will cause excessive torque, rapid overheating, and the risk of fire and other damage.

Connect the USB 2.0 cable to the computer only if the software has already been installed, see the

software installation instructions below.

Computer Requirements

You must have a fast computer to keep up with the high data rate and demanding processing needs of the camera. It is suggested to have an Intel Core 2 Dual processor, with 2 GB of RAM, and an AGP 128 Mb video card. Suitable operating systems include Windows XP SP3, Windows Vista SP2, or Windows 7. It must have at least one USB 2.0 socket, and for connection use a high grade USB2.0 cable; generally a short and “fat” cable (rather than a small diameter long one) will be lower loss and the most suitable.

Software Installation

The included disc is used to install the Sensor Technologies viewing and recording software on your Windows computer. Follow the instructions in the 88-page manual, which is included on the supplied disc under file name `sofm_USB_en_v1.10.pdf` or can be downloaded from http://www.sentechamerica.com/content/files_docs/sofm_USB_en_v1.10.pdf. The software itself is included on the disc with file name `StCamSWare(v3.02)` or a ZIP version can be downloaded from [http://www.sentechamerica.com/content/files_software/StCamSWare\(v3.02\).zip](http://www.sentechamerica.com/content/files_software/StCamSWare(v3.02).zip). Use the X86 version for 32-bit Windows or X64 version for 64 bit Windows. Do not connect the camera for the first time until the software is installed. You may need to separately install the Driver software with an XP computer. With some Intel i3, i5 and i7 processor computers you may need to revise the power saving settings as described on page 5 of the supplied disc’s 26 page specifications manual under file name `spec_STC-MC_MB_en_v1.02.pdf` or which can be downloaded from http://www.sentechamerica.com/content/files_docs/spec_STC-MC_MB_en_v1.02.pdf. Additional drivers and foreign language manuals can be downloaded from Sentech.

You will also need editing and “burning” software for making a DVD or Blu-Ray disc.

Mandatory Camera Settings

Following are the initial settings that **must** be programmed into your computer for proper operation of the camera. Otherwise you will get flickering or skipped frames and other problems. Later you can experiment with different Gamma, AGC, Shutter and other settings. The settings only need to be entered once and then Saved; after that they will be loaded automatically when you start the program with this camera connected.

Option; Settings; then click on Advanced tab at bottom of screen.

If access is forbidden, under Help enter password of: `sentechcamera`

Gain/Shutter

ALC Mode: for fully automatic exposure select Auto Shutter On/AGC On

Later you can experiment with other settings

Target Brightness: 74

Later you can experiment with other settings

Weight: You can choose equal exposure weighting of all picture regions as supplied

Later you can experiment with other settings

Brightness Tolerance: 5

Brightness Threshold: 5

AGC Range: 0 to 255 initially to be sure to see an image

Later you can experiment with other settings; *note*:

A lower number will reduce the maximum video noise level

Shutter Range: No upper limit

Lower limit 1/50 or 1/60 second; *note*:

If the computer has trouble keeping up, and there is enough light available, increase the lower limit to say 1/250 which will give the computer extra time to finish the calculations for each frame

Digital Gain: 64 normally

Later you can experiment with other settings; *note*:

A higher number will lighten the picture while perhaps coarsening gradation

White Balance

Full Auto to begin with

You can also pick Push To Set when no film is in the gate for a neutral balance, or to

help the color when badly off-color film is present
Manual is not recommended without instrumentation to judge its effect

Y (Luminance)

Gamma Mode: On
Setting 180
Later you can experiment with other settings; *Note:*
If the computer has trouble keeping up, and Gamma can be corrected later in editing, then you can record now with Gamma Off instead. Screen image will look harsh and dark until corrected in editing. *Note:*
Reverse will invert brightness values for experiments with negative film.
Sharpness Mode: Off
Later you can experiment with other settings

Color

Hue/Saturation Mode: On
Saturation setting 150 or according to film appearance
Later you can experiment with other settings
Hue: 0
Later you can experiment with other settings
Color Matrix: No Change

Color Gamma

No changes
Later you can experiment with other settings

Trigger

Trigger: On
Trigger Source: Hardware
Trigger Mode: Edge Preset
Soft Trigger: not used
Soft Sub Trigger: not used
Auto Sub Trigger: not used
Readout Source: not used
Noise reduction: not used
Exposure End Signal: Disable
Exposure Readout: Immediate
Exposure HD: Immediate

I/O (Input/Output)

IO0: Input
Trigger Input 10
Polarity Negative
IO1, IO2, IO3 not used
Exposure Delay 0
Strobe Start Delay 30
Strobe End Delay 0
Output Pulse Delay 0
Output Pulse Duration 32
Readout Delay 0

Other

Scan Mode Normal
Can select Partial or Variable Partial to crop off top and bottom of image, and possibly record at a higher FPS setting
Clock Speed Normal
If computer is slow, can select 1/2 and also reduce the running speed of the TVT
Still Image Picture Format BGR24
Color Interpolation Bilinear
Mirror Mode Off

Can be changed if running film incorrectly oriented
Rotation Normal
Display Mode GDI

When all data is entered, click “Save” tab to remember the settings for next time. Then, when you start the program you will immediately be able to see the picture.

After You’ve Captured the Film

When finished you have an AVI file that defaults to 29.97 fps where each video frame is an individual film frame, with no pulldown, interlace artifacts or blurred frames. If you play back the file in Windows Media Player or VLC, it will play back too fast. You can either change the frame rate with a free program like AVIFrameRate or change it in your video editing software. You would change it to play at the original frame rate of the film camera, such as 18 FPS for home movies or 24 FPS for commercially shot material.

The AVI file isn't the same aspect ratio as 16:9 HDTV, because the film frame is 4:3 shape. To fill the 16:9 frame, you would insert pillars on left and right in editing. When displayed on an HDTV monitor, the image will then be pillarboxed but nothing has been cropped or stretched.

Other Information

The TVT has a “Mechanism Hours” timer to measure how long the main drive motor and the mechanism have been running. This only advances in the Forward and Reverse modes, not in Rewind. The count is remembered without need for batteries when the unit is turned off.

Routine service:

After long use, the Claw Pivot and cams may need greasing. Instructions for greasing the claw pivot are here: http://www.tobincinemasystems.com/TCS_Public_PDF/TVTLub.pdf

A small amount of grease may also be applied to the cams. After years of use you may want to apply light oil to both ends of each sintered-bronze bearing on the shutter shaft.

Service adjustments:

- Focus, centering, magnification and all camera module settings are factory set and locked in place, and should not be disturbed unless you are doing a format changeover per the instructions.
- In case of odd symptoms, first check the output voltage of the regulated switching power supply modules. These should be 12 and 24 volts DC, $\pm 5\%$. The voltage should change little no matter what settings are made to the operating controls. The 24 volt supply may sag momentarily while the drive motor starts running.
- Note that the camera actually receives DC power from the computer through the USB 2.0 cable, not from the TVT power supplies. It is continuously triggered at divided crystal frequencies of 9, 18 or 24 Hz when the TVT is turned on. When the TVT is running, the mechanism is phase-locked to that same signal.
- If dust accumulates on the optics it should be removed with a clean camel’s hair brush or air blower. Fingerprints must be removed immediately with lens cleaner and lens tissue, following the instructions included with them.

Suggested Sources of Supplies

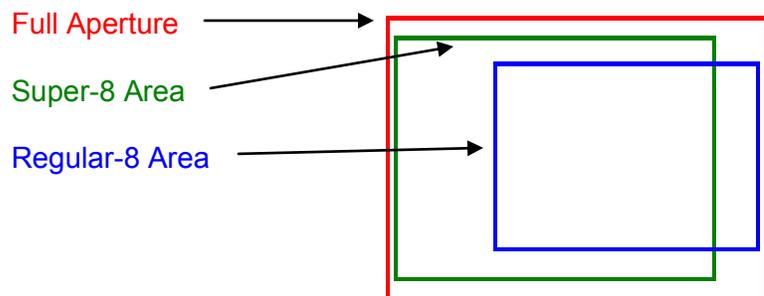
<http://www.urbanskifilm.com>

Film Format Changeover For dual-8 machines only

NOTE: If set for Full Aperture scanning, the mechanical & optical adjustment procedure in the section below is not required and the desired area is instead selected later in video editing.

You still select the Super-8 and Regular-8 claw position with the lever, and exchange the feed reel spindle. For regular-8 film, use manual exposure control because of the visible perforations, or set the Weight to ignore the upper and lower left edge of the image where the perforations show.

This is an approximation of the original recorded area, and the smaller area that would be selected in editing, for either super-8 or regular-8 film.



Mechanical & Optical Adjustment Procedure

Note: This is not required if instead you are selecting the desired area later in editing.

See Page 9 for illustration of traditional adjustments without video editing selection of area:

Claw Change: First, swing open the film gate to prevent stressing the claw and possibly bending or breaking it. Move the Claw lever 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. Close the gate again.

Feed Reel Spindle Change: If two spindles are supplied, use the 1/16" Allen hex driver to loosen the setscrew for exchanging them. Some reel spindles may instead use the .050" size. If a S8 feed reel spindle adapter is supplied, it slips on and off the R8 spindle. S8 film reels use the 1/2" (12.7mm) spindle or adapter and R8 film reels just have the basic 5/16" (8mm) size hole. (The spindle or adapter can be changed or not, to suit film that is wound on the wrong type non-standard reel.)

NOTE: Do not push the removable spindle on too far before tightening so that it rubs on the panel, which will cause an unsteady picture, stalling, or film damage.

The take-up reel spindle does not need to be changed as the film doesn't care what style reel it is on temporarily before it is rewound.

Counter Change: Not applicable. The TVT-D8PHD will only count super-8 footage directly. For regular-8, multiply the super-8 reading by 0.9 to compute actual footage.

Note: the following steps use a standard No. 2 Phillips screwdriver, not supplied. If yours is worn or damaged,

obtain a new screwdriver to prevent mangling the various screws.

Magnification Change:

For usual 30mm Lens: Loosen the Lens Lock Screw and follow the steps below without touching the glass elements. The lens is symmetrical so it does not need to be reversed when changing formats.

For usual 1024 x 768 pixel camera: Adjust so the left end of the lens extends 7/32" (5.5mm) past the left side of the mount for super-8. Adjust so the left end is 1/16" (1.5mm) past the left side of the mount for regular-8. With other camera options having a different size CCD sensor, or with a different imaging lens, these will be different.

Tighten the Lens Lock Screw. Make it tight but do not over-tighten as this could damage the lens.

The magnification may need to be changed slightly to accommodate variations in film camera aperture size, film shrinkage and the like. (Moving the lens to the right will magnify the image (zoom in); moving it left will reduce the size (zoom out).)

You should scribe a line on the lens barrel against the lens holder before moving it from the position set in manufacture, so you can re-set later to the same setting.

Centering Change: Insert the film to be copied into the film gate, a few feet past the end of the head leader. Pick a spot with lots of fine detail or that is grainy, for easier focusing (see below). Turn the Manual Advance knob so the film advances once while the shutter is closed, and then is stationary.

Loosen the four Centering Lock Screws on the top of the camera bracket by 1/8 of a turn, and slide the camera in or out on the elongated holes to center the image. Push up on the camera so it does not sag out of position while judging the centering.

Tighten the Centering Lock Screws.

Framing Adjustment: Turn the Framer knob (below the camera cover) to center the image vertically so the frameline (the dividing line between pictures on the film) does not show. (Unlike most equipment the TVT-D8PHD does not need to be running to see the effect of this adjustment.)

Note: The original Framing knob (above the mechanism) is no longer active for actual Framing owing to optical and mechanical changes. If it is set wrong however you will get a dark shadow at the top or bottom of the frame. Turning this original knob will move the aperture and pressure plate opening to remove it.

Focus Adjustment:

Loosen the two Focus Lock screws about 1/8 turn. While pushing down on the top edge of the bracket between the screws, slide the camera in and out for optimum picture sharpness. Enlarge the image to about 200% or 400% if desired so you can better see the film grain. Tighten the two Focus Lock screws while still pushing down on the bracket between the screws. If the focus shifts while tightening, try again.

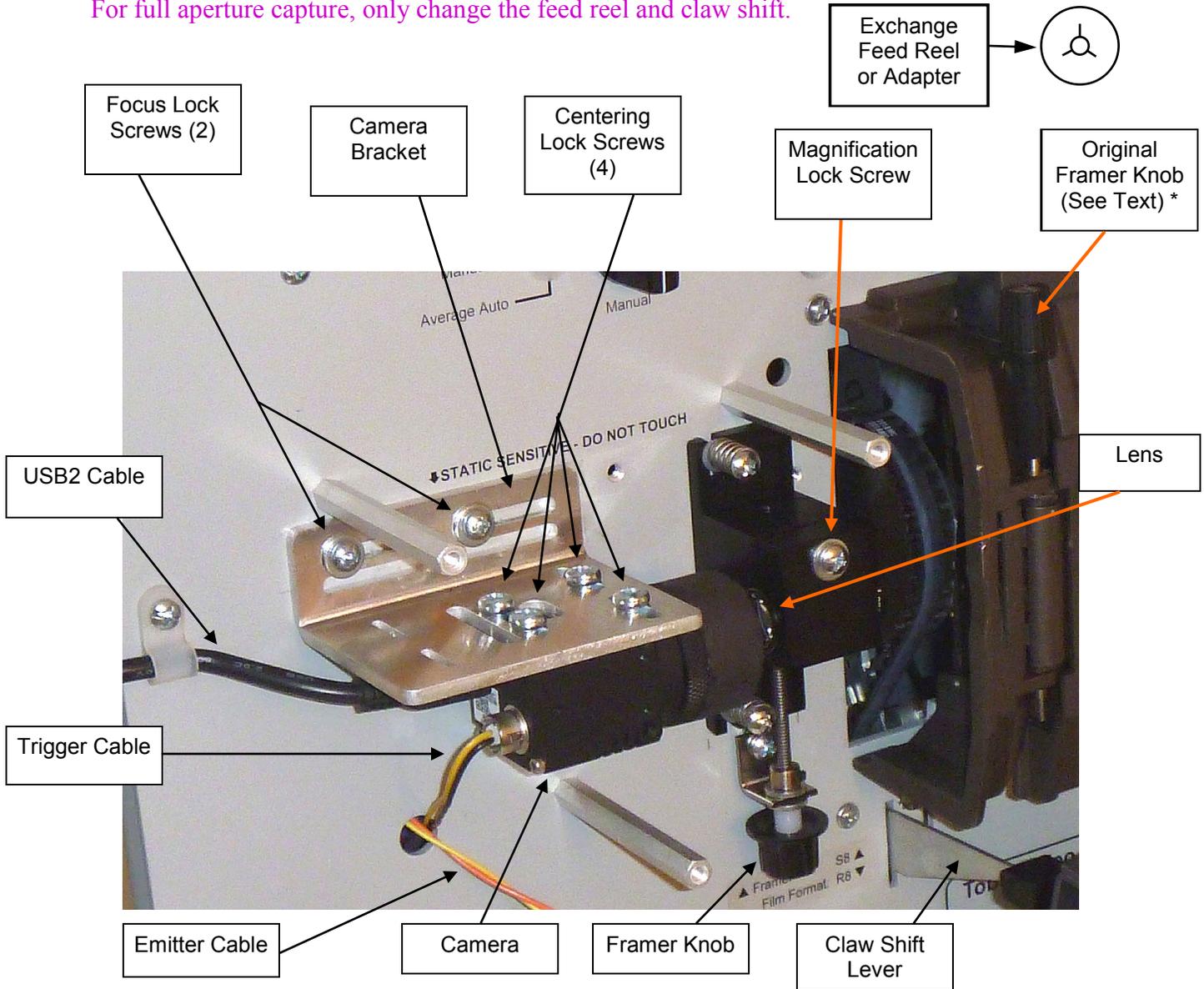
If necessary, re-adjust the Magnification, Centering and Framing settings as changing the focus may have altered them slightly.

When done, replace the optics cover and the 3 screws. Be careful to not pinch the Emitter wires between the optics cover and the panel or the mounting standoffs.

Only for the traditional mechanical changeover procedure:

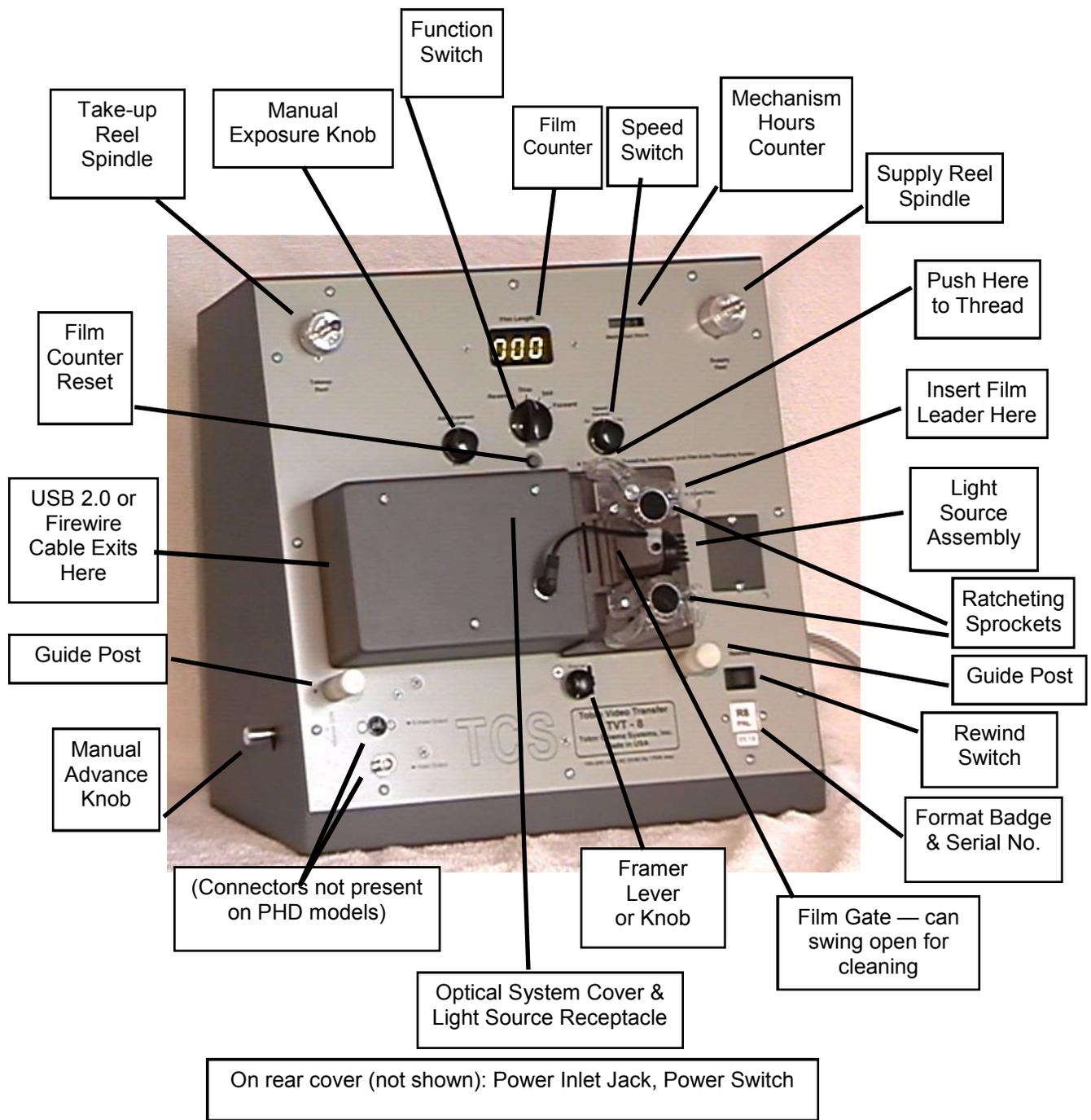
Film Format Changeover

For full aperture capture, only change the feed reel and claw shift.



* Will cause a shadow at top or bottom of picture if set incorrectly.

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<http://www.urbanskifilm.com>