

TVT-8BTS Tobin Video Transfer “True Speed” Auto Thread Sprocketless Type

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 is very bright. Also, the TVT-8BTS model emitter brightness is modulated to neutralize flicker in the video, and your eye sees this as flashing at a rate that could cause an epileptic fit in susceptible persons.



Basic Operation

Turn on the power with the switch on the right rear of the TVT. Check that the left-hand switch is in the “Peak Auto” or “Average Auto” position, the knob to the right of it is in the upper “Auto” position, and the right-hand rotary switch is in the “Normal Speed” position.

Super-8

Note: see page 8 for identification of the items on the front panel.

Regular-8

Switch the unit to “Still” and note that there are no hairs or lint visible in the picture on the underscanned video monitor. If there are any, swing open the film gate and brush or blow out the hairs. 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:

- TVT-S8 machines are labeled “S8TS” on the front badge and are for super-8 film. Super-8 film has small sprocket holes and comes on a reel with a 1/2" (12.7mm) diameter center hole.
- TVT-R8 machines are labeled “R8TS” on the front badge and are for regular-8 film. Regular-8 film has larger sprocket holes and comes on a reel with a 5/16" (8mm) diameter center hole.

Additional “NTSC” and “PAL” designations on the badge show the video standard for which the model is made. NTSC is used in the USA, PAL is used in Europe.

If the film is the wrong type, change to the other model of TVT machine.

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. The TVT requires film reels that are not unbalanced, or that are bent and pinch the film edges.

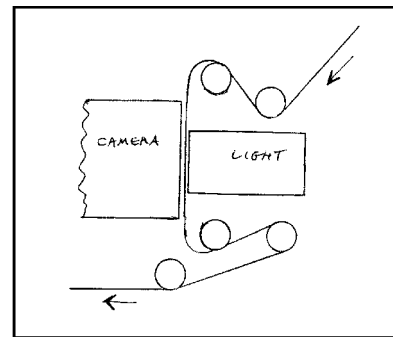
The TVT has easy manual threading. This sprocketless design prevents the film damage that could otherwise occur if a bad splice sticks in the film gate and film sprockets continue to drag the film through. Threading is done as follows.

Note the two different threading paths according to whether the film will be run forward as normally done, or will be run in reverse after checking the start of the film for example. Note that a swinging roller is now installed, farther to the right than the first roller shown in the drawings.

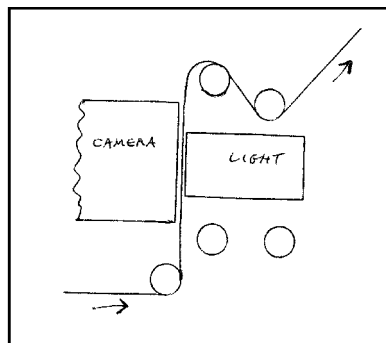
To Prevent Small-Reel Jitter: The recommended reels are light weight plastic 400 foot size, with a large 2.4 inch (6 cm) center hub diameter. If running from smaller reels, heavier reels, or reels with an old style small center hub where the film winds on, this can cause intermittent severe jitter in the film. To cure this, do the following expedient cure: Place the supplied **Nylon washer** on the Supply reel spindle before installing the reel. This will reduce the pull on the film by not having to turn the Supply reel motor. The washer must be removed before Reverse running or Rewind.

To thread for **forward**: Swing open the light source to reveal the film gate. Pull a few feet (1 meter) of leader past the film gate area and insert it into the film gate. Close the film gate. Route the film around the upper rollers, the two retarder posts, and the lower rollers as shown. Attach the beginning of the leader to the takeup reel, 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 slowly while running, until it is not seen.



Threading path for Forward



Threading path for Reverse

To run in **reverse**, you must re-thread the film below the film gate so the two retarder posts are bypassed as shown. 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 will have jitter and ghosting; this is normal as the shutter is correctly synchronized only in Forward. Correct the threading path to include the two retarder posts again.

Start the video recorder. Switch the TVT to "Forward" and you will be recording the film on video.

The film should be inspected, repaired, cleaned and lubricated before it comes to you for transfer. A bad splice or multiple damaged perforations can cause the film to stick in the film gate. You can jab the film down with your finger between the two retarder posts to force the film to continue running.

At the end of the film, switch to "Stop" and stop the recorder. Record 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 rollers 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. 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.

Installation

Connect the TVT machine 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. Both can be used at the same time if desired:

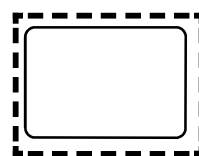
- The S-Video (“Separate”-video) Y/C output may give a cleaner video signal in many cases, as the luminance (brightness or Y) and chrominance (color or C) signals are sent through separate wires and will not interfere with each other, and thus not cause odd artifacts to appear in the picture. This preferred 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 a professional BNC type, so use the BNC cable to connect to commercial video equipment. Use the BNC to RCA phono type cable, or plug adapter, to connect to consumer equipment.

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 footage counter to light up, and for black 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 will not be a problem as the customer will not see the entire video frame on his TV set.



Conventional TV
or Monitor Cuts
Off Picture



Underscanned
Monitor Shows
All The Video So
No Surprises

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.

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: Super-8 mechanisms are fussy about splices, compared to regular-8 ones. If your cement splices of super-8 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 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 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.

Running Speeds

The **TVT-8BTS** models run at absolutely precise quartz crystal controlled speeds of 18.000 and 24.000 FPS (frames per second) without flicker. This exclusive Tobin invention gives speeds that correspond exactly to the standard filming rates. The speed switch gives you a choice of 9, 18 and 24 FPS. 9 FPS is for moving the film slowly to look for a specific frame, or to check threading, and is not usable for transfer. The TS option gives smooth screen motion and a great degree of exposure correction for dark film, blending the film frames somewhat. This gives better looking screen motion than if transferring the film at the wrong rate, then using a computer to insert or remove duplicate frames at regular intervals, which gives an extra jerkiness or judder to movement.

The lower cost **TVT-8B** models only have one running speed, which is 19.980 FPS for NTSC and 16-2/3 FPS for PAL. These have frame by frame scanning without blending film frames, and do not have the standard filming rates, instead the running speed is suited to making flickerless video, making each film frame into three video fields. These have a great degree of exposure correction for dark film. The speed switch is not present, or if present it is inactive.

Exposure Correction

The correction uses your choice of Peak or Center-Weighted Averaging sensing, for optimum results from a variety of original moderate over- and under-exposure conditions. This is selected with the Peak - Manual - Average switch to the left of the rotary Auto - Manual knob. Peak sensing is recommended for reasonably well-composed film, maintaining the mood of the film. Average sensing is used for film that is strongly backlit (shooting into the sun) or that is dark and also has a light source (movie light or bright window) near the edge of the screen, or that is very badly overexposed. A minimum brightness level can still be set with the Manual knob, to prevent over-reacting to flashbulbs going off and the like.

For critical transfer for fussy customers who are willing to pay extra, the brightness can also be set fully manually. This latter option usually means that the video must be edited later, to remove the overlap and startup jitter when previewing, starting and stopping the TVT for each brightness correction.

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. The count is remembered without need for batteries when the unit is turned off. A time interval for servicing the drive motor and mechanism has not yet been established.

Routine service:

After long use, the Claw Pivot may need greasing. Instructions for this will be furnished on request.

Service adjustments:

- After long use, the white balance of the LED emitter and 1CCD camera module could change. To reset the white balance, turn to “Still” and “Auto” without film but with a 0.7ND neutral or perforated solid filter in the light path, and observe the output signal with an oscilloscope or waveform monitor. Adjust the R and B (red and blue) pots in the camera module, for minimum chroma carrier, preferably from the S-video “C” output. Be very careful with the tiny pots as they are easily damaged or torn loose from the circuit board. For the 3CCD camera, set up as above but merely push the “White” button on the camera rear. If successful, “OK” should appear on the monitor screen.
- Automatic exposure setting should be quite stable. Current optimum factory setting is .85 volts p-p with no film in the gate. Average film will then reach about 100 IRE. The “Average” setting is for .75 volts with no film. Voltage readings are peak to peak, and will be double if measuring an unterminated output.
- In case of replacing the timing belt, it will be necessary to reset the “Shutter Phase” selection jumper. While running film Forward, try changing the jumper positions one at a time in sequence. Pick the phase number that gives the best safety margin against the jitter and ghosting of other positions. With the BTS model, check at both 18 and 24 speeds and pick a position that is common to both.
- Focus, centering, magnification and all camera module settings are factory set and locked in place, and should not be disturbed.
- 1CCD camera setup switch settings are normally: 1 on, 2 on, and 3 on only in the B version, the rest off. Switch 1 when Off turns on the AWB (Automatic White Balance) which may help off-color film somewhat, but it should be left off for running film with good color to prevent odd color effects when the scene composition changes. Switch 8 controls negative or positive output, which could be considered an operator setting for special effects or for experiments with negative film, however owing to the delicate and static-sensitive nature of the camera module this is best left alone. Changing other settings will cause malfunction or less than optimum results. With the 3CCD camera, there may be hundreds of variables so refer to the camera manual and make changes only with caution, after writing down the original settings. We generally save all the File 1 settings in Files 2, 3 and 4 also so you could change to one of these if needed, if the changed settings are hopelessly incorrect.
- In case of odd symptoms, first check the output voltage of the regulated switching power supply modules. These should be 12 and 18 or 24 volts DC, $\pm 5\%$. The voltage should change little no matter what settings are made to the operating controls. The 18 or 24 volt supply may sag momentarily while the drive motor starts running.
- 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

Regular-8 and Super-8 400' reels in boxes of 200 pieces:

Taylorreel Corp. www.taylorreel.com 770-503-1612

Super-8 400' reels (8mm SMD component reels 7") in boxes of 100 pieces, Item VP-A708-08: Media Distributors, formerly Plastic Reel Corp (PRC) 800-929-1637 or (818) 980-9916 Attn: Mario in West, 800-772-4748 in East

White boxes for 7" diameter 1/4" audio tape reels in boxes of 180 pieces:

Protape Northwest 800-331-6107 and probably other suppliers

Regular-8mm Kodak White Movie Leader in 50' roll: # 163 5002

Super-8 Kodak White Movie Leader in 50' roll: # 191 0116

Super-8 Kodak White Movie Leader in dispenser box of 1000' (more economical): # 882 7362

Kodak Professional Film Cement 16 oz: #195 6176, 1 gallon: #195 6150, both plus \$20 hazardous shipping fee.

Kodak ordering toll-free number: 1-800-621-3456 (1-800-621-FILM)

Kodak Presstapes are now sold by Urbanski Film, (708) 460-9082 <http://www.presstapes.com>

Other suppliers may have editing equipment and sometimes have regular-8 leader. (Note: regular-8 leader in bulk is sometimes supplied in the double-8 width, and needs slitting down the middle to 8mm for use. Some kinds of leader cannot be cement spliced. Ask before buying. Slitters can be imported from Olex's web site at <http://www.geocities.com/russiancamera/s8-equipm/s8-equipment.htm> in the Ukraine.):

Christy's (equipment, leader, reels in small quantity) 800-468-6391

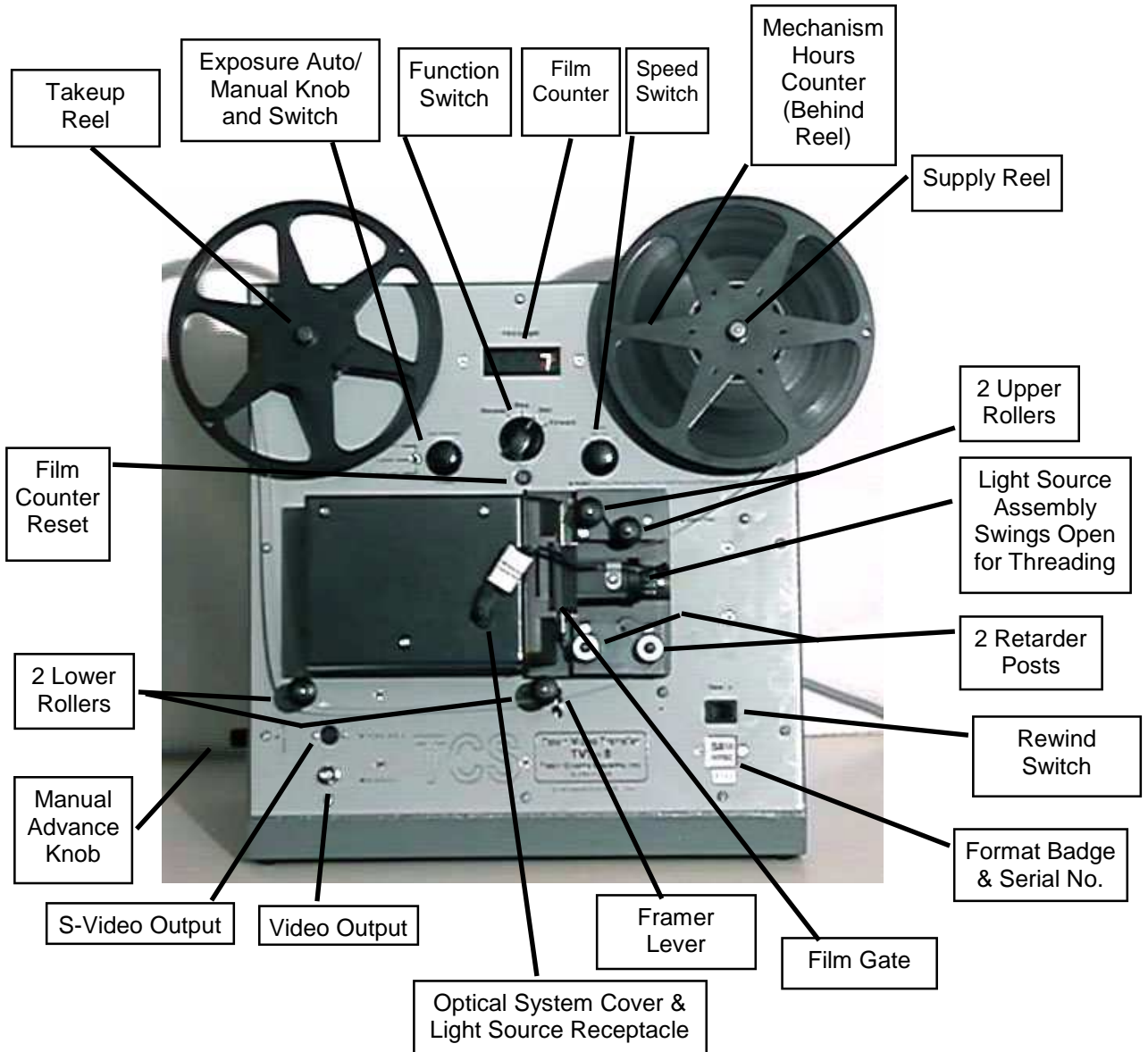
Neumade (manufacturer of rewinds, leader) 203-270-1100

MPE (equipment, leader, reels in small quantity) 212-245-0969

Starex (leader) 201-997-1555

FCA (leader) 818-845-7651

ECCO makes a film cleaning device that is mounted between a pair of rewinds. These are sold by several dealers. Film cleaning fluid is made by several companies or else you can use Freon TF, 99+% isopropyl alcohol, etc. with a small amount of wax dissolved in it for lubrication.



On rear cover (not shown): Power Inlet Jack, Power Switch

Tobin Cinema Systems, Inc.

<http://www.TobinCinemaSystems.com>