

# Tobin TVT-8PHD Progressive Scan HD High Definition Telecine

## Cautionary Notes:

1. To avoid personal injury, keep your fingers, hair, etc. away from moving parts, especially the spinning shutter blade. Avoid touching the lamp cover and lamp as they get hot.
2. Dangerous voltage and gears, pulleys, belt and chain inside. Do not remove front panel. Refer servicing to qualified personnel.



## Basic Operation

**NOTE:** The TVT-8PHD is 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 and the software must be installed before you can proceed further.

The TVT must be connected to AC power. Start the computer viewing and recording program by clicking on the IC Capture 2.4 icon. Select this DFK 23U series camera. Pick a suitable Size parameter in the program header +/- so you can see the whole picture without cutting off the edges, and there are no scroll bars.

Note: see page 7 for identification of the controls and other parts.

Switch the unit to “Forward” and note that there are no hairs or lint visible in the picture on the computer monitor. Try both Format switch settings as separate apertures are used for each. If there are any hairs, brush or blow them out. A pipe cleaner or fuzzy stick may be helpful to dislodge dirt that won’t blow out. Switch back to “Stop.”



Check that the film format is correct for the Format switch setting:

- **Super-8** film has small sprocket holes and large pictures and normally comes on a reel with a 1/2" (12.7mm) diameter center hole. Move the Format switch up to the S8 or Super position.
- **Regular-8** film (also known as Standard 8) has large sprocket holes and small pictures and normally comes on a reel with a 5/16" (8mm) diameter center hole. Move the Format switch down to the R8 or Standard position.

You may need to change the Supply reel spindle to suit the reel provided. Use the 1/16" Allen key in the setscrew. Do not push the spindle on so far that it rubs on the front panel.

## Automatic Threading:

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 (1.3 m) 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 the leader near the end straight across in between perforations and make little bevels on the corners, if the film preparation department hasn’t already done so. If it is bent or excessively curled, flatten it.

Switch to Forward. Push down the Loop Former and hold it in the down position. Insert the leader into the film loading slot, it will be pulled through by the sprockets and claw. After the film leader emerges from the lower sprocket, release the loop former and guide the film below the two film posts and on to the Take-Up reel. Turn back to “Stop.” Attach the film to the hub of the reel and wind the film clockwise a couple of turns.

NOTE: Only a super-8 type reel spindle is provided for the Take-Up reel, since the film does not care which type reel it is temporarily wound up on until rewound.

If the frameline (the dividing line between pictures on the film) shows, move the Framer knob or lever while running Forward until it is not seen. If it is the lever type, move it slowly.

Note that the camera is continuously triggered at 22.5 FPS in Stop and Still modes. This is so you can see the image on the computer monitor and make any needed adjustments to exposure, framing, etc. and the effects of the changes, plus the visibility of any over-bright room lights, are shown quickly on the monitor.

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." Note that in Reverse the image may have distortion, blur or flicker; this is normal as the shutter is correctly synchronized only in Forward.

**NOTE:** The TVT-8PHD has variable speeds and you can run at anything from dead slow up through 24 FPS (frames per second) with no effect on the result. The number of frames in the file will not be affected by the running speed of the film when transferring, as one frame of film will always result in one frame of video file. The 18 FPS speed marking is approximately correct, but disregard the 9 and 24 markings as they are only for TVT models with switch-selected speeds.

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, this will cause a chattering noise and the picture will start jumping up and down. Press the Loop Former button briefly to reset the loops. (The film loops are needed in order to isolate the smooth motion of the sprockets from the jerky film movement through the gate, pulled down rapidly by the claw.) If this doesn't work, turn to "Stop" and also stop the computer recording. You can manually reset the loops by opening each sprocket as necessary by pushing on the tab (down for the top sprocket, up for the bottom sprocket) to open the sprocket shoe, and re-position the film on the sprockets so there are about equal free loops both above and below the film gate. Then resume the transfer.

**To Record:** Click on **Capture**, then **Toggle Recording Info Dialog**. Generally you will assign a file name and select a compression format, or select Uncompressed if you don't mind generating huge files. (Use the favorite compression codec of your video editing department. Note however that 64 bit color may have to be recorded Uncompressed, making huge files.) Click on the Start button to start recording. (While recording, a Stop button will appear.) Switch the TVT-8PHD to "Forward" and you will now be recording the film on the computer.

At the end of the film, switch to "Stop" and stop recording. 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. Turn On the Rewind switch. Monitor the progress as the rewinding is very fast, and be ready to turn the switch back Off when you see the white leader at the start of the film. Remove the supply reel after it stops, and you are now ready to transfer the next reel.

## 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, and 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 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:**

Kodachrome films processed by Kodak usually cause no trouble. Some film types, or films developed by cut-rate labs, are not lubricated in processing and can give an unsteady image and noisy running until lubricated as described above. 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 into 100 to 240 volt AC (alternating current) power (mains) at 50 or 60 Hz (Hertz, or cycles per second.) The correct cable should be provided; if not, go to your local computer store and buy the appropriate IEC 3-wire cable for your locality. Check that there is no sunlight or bright room light shining on the light diffuser as this can cause flicker or color shifts.

Connect the USB 3.0 cable to the computer. The correct jack should be marked "USB3" or "SS" for Super Speed. Don't disturb the cable where it comes out of the camera as a momentary loss of contact will require closing and re-starting the program.

## **Computer Requirements**

You should have a modern computer with Intel dual-core processor i3 or better, running Windows XP, Vista, 7 or 8 and with a factory original USB 3.0 jack. Also, 2 GB RAM, a Graphics card with 24 or preferably 32 bits and DirectX 9.0c or higher. The Linux operating system may also work with the Imaging Source software for that operating system, but we have not tried it.

If you plan to do Uncompressed recording, you may need a RAID array to accept the huge resulting files.

## **Software Installation**

The included disc is used to install the Imaging Source viewing and recording software on your Windows computer. If the disc is missing, or if you want an updated version, you can download it from the Imaging Source website: [http://www.theimagingsource.com/en\\_US/products/cameras/usb-cmos-ccd-color/dfk23u445/](http://www.theimagingsource.com/en_US/products/cameras/usb-cmos-ccd-color/dfk23u445/). Follow the instructions on the paper sheet. Do not let the computer install generic software or drivers. Run the Usbcam driver program first after connecting the camera, then the IC Capture program. Use the X86 version for a 32-bit computer and the X64 version for 64-bit.

Linux software can also be downloaded from The Imaging Source.

You will also need editing, mastering or "burning" software for making a DVD or Blu-Ray disc, or tape.

## **Mandatory Camera Settings**

Following are the initial settings that **must** be programmed into your computer for proper operation of the Imaging Source camera. Otherwise you will get flickering, blurred or skipped frames. Later you can experiment with different Gamma, Gain, Shutter and other settings.

## **Activate External Trigger**

Maintain All Property Automations

OK

**Additional Settings:** (NOTE: Available settings depend on camera model and software version. Set if appropriate. If it does not show, disregard.)

These appear at the top of the program's screen: File, Device, Capture, Effects, View, Window, Help and:

Model & Serial Number: (This is automatically received from the camera. )

Video Format: RGB32, 1280 x 960 for DFK23U445.

Frame Rate: Set to the highest available value, 30 FPS or more. This governs the speed of the computer processing so it can keep up, and is NOT the actual transfer speed which is 4 to 24 FPS, determined by the TVT variable speed dial.

The following tabs under **Device** are not used initially:

Binning: Not used

Drive Control: Not used

Noise Reduction: Disabled (to prevent frame blending)

Rotation: Not used

DeBayering: Not used

ROI (Region of Interest): Not used

The following appear under the **Device Properties** tab.

### **Color**

Hue: 0

Saturation: 100

White Balance: Preferably set it manually, as the halogen light color is at the extreme edge of automatic correction. Typically set Red=50, Green=60, Blue=255. You can enter manually based on the Histogram graphs (turned on by clicking on  above) showing R G B (red, green, blue) levels of the blank white screen.

You can try:  Auto (Continuous automatic for wildly varying film quality in the Blue direction) OR One Push (Balances to an overall average grey if within range.)

White Balance Mode: Grey world

Auto Preset: Not used

Temperature Preset: Not used

Temperature: Not used

Color Enhancement:  Enable

### **Exposure**

Brightness: 0

Contrast: 0

Gain: 0 dB (Can increase, OR click on  Auto, for very dark film)

Exposure: 1/50 second to 1/10,000 second (typically 1/600) to manually control brightness level, OR click on  Auto for automatic exposure control

Auto Reference: 50 (Change if Auto results are consistently light or dark)

Auto Max Value: 1/200, or 1/50 if running very dark film (Do not select Auto.)

Highlight Reduction: (Seems to look better if you do not click on Enable)

### **Image**

Sharpness: 0

Gamma: 70

Denoise: 0

### **Special**

Trigger:  Enable

Software trigger: (not used)

Polarity (leave unchecked)

Delay: 15  $\mu$ s

GPIO (Section not used)

Strobe (Section not used)

**WDR** (Wide Dynamic Range): (not used)

- Effects:** (not used)  
**View:**  Status Bar  
**Window:** (not used)  
**Help:** (If you need help about the program)

To **save** all these settings, go to **File: Save Configuration**. The software will pick a general location, you enter the camera model, TVT-8PHD model, or some other identifier. Click OK.

You can reduce the image size so the whole video frame will show on the monitor, for adjusting the framing, or you can enlarge the image to check focus and grain. Use the + / - buttons at the top.

If a lot of image processing is being done, you might need to use a faster shutter speed of say 1/500 or 1/1000 etc. to give the computer enough time to do it, especially if able to run above 24 FPS.

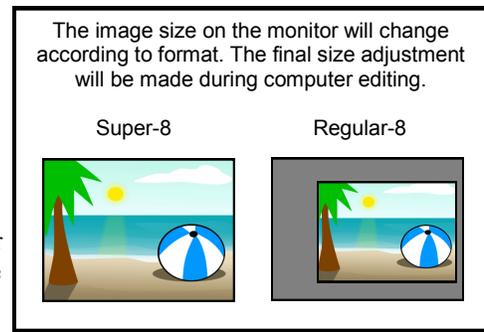
You will note that the automatic color and automatic exposure changes occur in discrete steps, unlike the smoother looking changes of most analog cameras. To avoid this, stop running, do a manual change, and resume the transfer from the start of the scene.

## After You've Captured the Film

When finished you have an AVI file where each video frame is an individual film frame - no pull-down, blended or blurred frames. If you play back the file in Windows Media Player or VLC, it'll probably play back at the wrong speed. You can either change the frame rate (typically to 18 FPS) in the header with a free program like AVIFrameRate or AVIFrate, or change it in your video editing software.

To capture film with 64-bit color instead of 32-bit, remember that the file size will be approximately doubled, it may not be possible to use compression, and it may not display properly with a conventional 24 or 32 bit video card and monitor.

To make a DVD or Blu-Ray disc, you will need video editing or mastering software (not included) to insert extra or interpolated frames so it will play at the correct speed, and perhaps adjust the aspect ratio from 4:3 (12:9) up to 16:9 by inserting blank bars or wallpaper on the sides, so the viewer will not have to change the aspect ratio setting on their usual flat-screen 16:9 ratio HD TV set.



## Other Information

**Footage Count:** The TVT-8PHD includes a digital footage counter that will count the film passing through, and is normally supplied to be correct for super-8 film. For regular-8 film, multiply the figure by 0.9 or 9/10ths. When ordering, you will have specified wither the count will be in feet or in meters. When ordering, if you specified the unit will only be used for regular-8, the count modulus would have been internally set to read correctly for this, and the count for super-8 will need correcting by 10/9ths. A separate **Mechanism Hours** counter keeps track of how long the mechanism has been running, as a guide to future servicing.

### Routine service:

After long use, the cams and other parts may need greasing. Refer to your authorized Chinon, Keystone or Bell & Howell service provider for lubrication. The factory recommended lubricant should be applied to the cams and followers. You may want to have applied a drop of light turbine oil to each bearing on the shutter and motor shafts, unless something else is specified.

### Lamp Replacement.

The light source is a 12 volt 20 watt type BAB or BAB/FG (MR-16 dichroic "cold mirror" reflector GU5.3 base 38° Flood) tungsten halogen lamp with about 3000 hours rated life. A tungsten incandescent filament eliminates the flicker that would be obtained from an LED (light emitting diode.) An LED has "noise" in the light output that your eye can't see, but the peaks and valleys are visible with a microsecond-range shutter speed.

To replace, remove the cover screws and cover and push right on the lamp ejector lever. Restore the lever, push the new lamp's pins fully down into the slots, and replace the cover and screws. Use a reputable brand of lamp and do not touch the halogen capsule inside the reflector with your bare fingers.

**Service adjustments:**

- Focus, centering and magnification are factory set and locked in place, and should not be disturbed.
- In case of odd symptoms, first check the voltage of the power supplies. The motor runs on DC of 36 volts, pulse width modulated. The lamp and electronics is supplied from a 12 volt DC  $\pm 2.5\%$  regulated power supply and it should not change under any operating condition, though there can be a glitch when the motors start.
- Note that the camera actually receives DC power from the computer through the USB 3.0 cable, not from the TVT's own power supplies. It will become warm and its pilot light (if any) will be lit while the computer is on and connected, even if the rest of the TVT is turned off.
- The drive belt is replaced with an original equipment Chinon Whisper or Bell & Howell 10MS replacement belt, or you can substitute a "Dash-232 Silicone O-Ring" belt. It might be possible to change belts without removing the front panel from the case, by removing just the optics cover.
- 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>

**Tobin Cinema Systems Inc.**

