

# Tobin TVT-8PHD C 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.
2. Dangerous voltage inside. Do not remove back cover. Refer servicing to qualified personnel.



## Basic Operation

**NOTE:** The TVT-8PHD C 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 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 23U445 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.

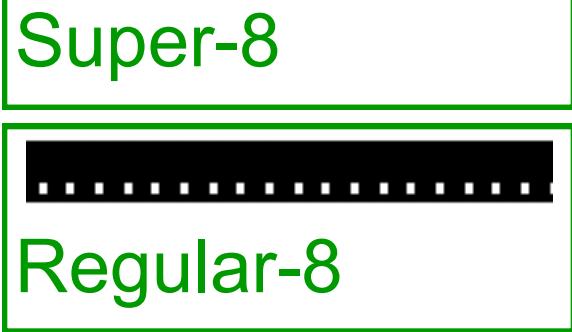
Switch the unit to "Project" and note that there are no hairs or lint visible in the picture on the computer monitor. Try both Format switch settings as separate

apertures are used for each. If there are any hairs, brush or blow them out. A pipe cleaner 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 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 to the R8 or Standard position.



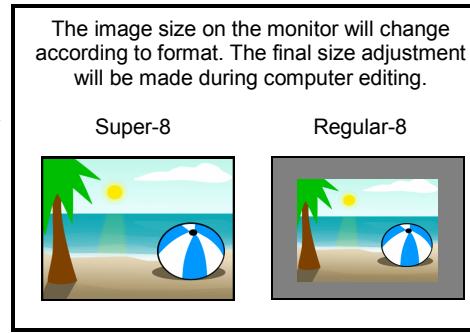
You may need to change the adapter sleeve on the Supply reel spindle to suit the reel provided. It slides on by matching up the longer slots in the sleeve with the spokes of the reel spindle, and pushing it on. To remove it, pull it straight off. Some spindles are dual purpose and do not need changing.

NOTE: take care not to lose it as we were lucky to get the one furnished and can not guarantee supplying replacements.

## 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. Fold the tab over to prevent the reel from falling off. 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 3 feet (1 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, use the leader trimmer that we provide when one is available. Or, use a scissors and 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, flatten it.



**For models without a dedicated “Thread” switch position:**

Switch to Forward. Push down the F (Forward, left hand) loop former until it locks in the down position. Insert the leader into the slot, it will be pulled through by the sprockets and claw. After the film leader emerges and starts to wrap around the Take-Up Reel, switch to Project or Lamp and the loop former will disengage.

**For models with a dedicated “Thread” switch position:**

Switch to Thread. Insert the leader into the slot, it will be pulled through by the sprockets and claw. After the film leader emerges and starts to wrap around the Take-Up Reel, switch to Project or Lamp and the loop former will disengage.

**For both types:**

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.

Note that the camera is continuously triggered by the TVT while running. 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 radio buttons on the computer screen. To see the effect of the picture settings when stopped, you must go into the camera menu and temporarily turn off Trigger operation. Then when finished, restore Trigger. Or, on some mechanism models you can use the Still mode to see the picture if the shutter keeps running to trigger the camera, during Still.

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 frame blending, blur or flicker, depending on the exact model; this is normal as the shutter is correctly synchronized only in Forward.

**NOTE:** The TVT-8PHD C has variable speeds and you can run at anything from dead slow up through 25 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. Film that was photographed originally at say 16 or 18 FPS will still be 16p or 18p in the file, though you need to change the AVI header to 16 or 18 FPS for it to play back at the right speed on the computer. You will need additional editing or mastering in the computer for the material to be viewed at the correct video rate in the final tape or disc.

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 F (Forward, on the left) 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 running in reverse, instead push the R (Reverse, on the right) loop restoring button. If this doesn’t work, turn to “Stop” and also stop the computer recording. You can manually reset the loops by removing the front cover, open 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 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 DV compression is standard definition and not high definition.) Click on the Start button to start recording. (While recording, a Stop button will appear.) Switch the TVT-8PHD C 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 to Reverse to rewind the film. Remove the supply reel after it stops, and you are now ready to transfer the next reel.

Note: if the mechanism has extra features such as Step, Slow or Still you might as well in most cases not use them, as with most models the shutter continues to run at the same speed as before, and this will record additional identical frames of video, which is a waste of memory. You can change the display rate in the editing stage.

## 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 3 feet of leader on the start for proper threading of the TTV, 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 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 TTV 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.

## **TTV Installation**

For the USA version, plug into 115-120 volt AC (alternating current) at 50 or 60 Hz (Hertz, or cycles per second.) 100 volt power (Japan) should still work but the maximum speed will be reduced. For the export version, the unit will be wired for 230-240 volt AC 50 or 60 Hz.

Connect the USB 3.0 cable to the computer. The correct jack should be marked "USB3" or "SS" for Super Speed.

## **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 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 a 64-bit model.

Linux software can also be downloaded from The Imaging Source.

You will also need 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

- Disable 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

Frame Rate: Set to the highest available value, 30 FPS or more. This governs the speed of the computer and camera processing so it can keep up, and is NOT the actual transfer speed which is 12 to 25 FPS, determined by the TVT settings.

Flip Video:  (Horizontal Flip)

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: Auto (Continuous automatic for wildly varying film quality) OR
  - One Push (Balances what is shown on the screen to an overall average grey, most accurately giving a neutral balance when used with no film in the gate )
- White Balance Mode: Grey world
- Auto Preset: Any
- Temperature Preset: Daylight
- Temperature: 6500
- White Balance manual settings: Can enter manually based on the Histogram graphs of R G B
- Color Enhancement:  Enable

### Exposure

- Brightness: 0
- Contrast: 0
- Gain: 0 dB (Can increase or click on  Auto for very dark film)
- Exposure: 1/200 second to 1/10,000 second (typically 1/800) to manually control brightness

level, OR click on  Auto for automatic exposure control  
Auto Reference: 60  
Auto Max Value: 1/200 (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, TTVT-PHD 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 1/250, 1/500 or 1/1000 etc. to give the computer enough time to do it, especially above 25 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 that defaults at 29.97 FPS where each video frame is an individual film frame - no pulldown or blurred frames. If you play back the file in Windows Media Player or VLC, it'll probably play back fast. 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.

When displayed on an HDTV monitor set to 16:9 the image will be stretched. To fix this without video editing requires the viewer to change his HDTV's setting to 4:3, which is a bit of a nuisance and the procedure may have been forgotten. To fill the 16:9 frame with an image, making it more convenient for the viewer, you could crop the image or stretch the frame, with loss of information, resolution or natural proportions. Or, preferably you can insert "pillarbox" black bars, blurred versions of the central image, or some sort of wallpaper, on the left and right sides so the HDTV can be left at the accustomed 16:9 ratio with no film detail lost or mangled.

## Other Information

**Footage Count:** The TTVT-8PHD C does not have footage or running time counters. Generally the original length of the film is not much of an issue with digital capture since the material will be edited down. However the length can be computed from the frame count in the file's Properties divided by the following number: Super-8 film is 72 frames per foot and regular-8 is 80 frames per foot. For metric system fanciers, this is 262.47 frames per meter of regular-8 and 236.22 frames per meter of super-8.

### 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.

**Service adjustments:**

- Focus, centering and magnification are factory set and locked in place, and should not be disturbed.
- The Trigger Sensitivity adjustment should be set to output 7 volts from the phototransistor lower terminal when the opening shutter blade when rotating forward is 1 cm or 3/8" past the top of the aperture (counter-clockwise looking from the light source.) This should suit the camera's electronic shutter. The setting should not need to be changed for many thousands of hours.
- In case of odd symptoms, first check the voltage of the power supplies. The motor runs on unfiltered DC of about 30 volts coming from a 35 volt AC transformer winding through a bridge rectifier and speed setting resistor or rheostat, and will rise to 35+ volts at the forward-reverse switch input when stopped. The light emitter and trigger circuitry is supplied from a 12 volt DC  $\pm 2.5\%$  regulated power supply and it should not change under any operating condition. NOTE: Use caution if measuring the motor circuit as many models use a non-isolating autoformer and the voltages can be riding on dangerous 120 volt line voltage.
- The light source is a white LED (light emitting diode) that should last for tens of thousands of hours and outlive the rest of the TVT, so no spare is suggested or included.
- 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.
- 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.**

