Sniper 16 Pro: 16mm Film Conversion Equipment
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Introduction

This tutorial serves as a guide for School of Information students, faculty, and staff using the Sniper 16 Pro, a film conversion unit that transfers film to a digital medium more safely than many other methods. In order to use this machine, please watch the IT Lab’s other tutorial on film, Small Gauge Film: The Basics (http://www.ischool.utexas.edu/technology/tutorials/graphics/film/). It contains helpful information on handling and identifying film, performing splices, and transferring reels of film to an archivally-acceptable means of storage.

This tutorial assumes:
• A basic understanding of film composition.
• A familiarity with identifying film gauges, sprocket holes, and frames.
• Experience using other methods of digitization, such as VHS to DVD.
• Film to be digitized has been cleaned, is not shrunk to a serious degree, and is wound onto the reel properly.
• The Sniper machine is set up and hooked into a computer.

Objectives

This tutorial will cover these topics:
• Identifying parts of the Sniper.
• Identifying parts of the projector.
• Identifying parts of the camera.
• Loading film on the projector.
• Previewing film with Dodcap.
• Adjusting the camera & projector.
• Tips for capture.
• Capturing film.
• Watching the new digital video.
• Saving and converting the new digital video.
• Rewinding film on the projector.
## Important Parts of the Sniper Equipment

<table>
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<tr>
<th></th>
<th><strong>Part</strong></th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Analog-to-Digital Converter:</td>
<td>This machine turns the analog signal from the projector into a digital signal the computer can read.</td>
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<tr>
<td>2</td>
<td>Firewire Cable:</td>
<td>One side plugs into the converter box, the other to the computer.</td>
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<tr>
<td>3</td>
<td>Hitachi HV-C10A Digital Camera:</td>
<td>The camera is positioned to look directly at the projector’s gate (see #12).</td>
</tr>
<tr>
<td>4</td>
<td>Adjustment Screws:</td>
<td>In order to position the camera correctly so that it can capture the entire frame of film, unscrew these screws and reposition the camera in its cradle. This is not something that should need to be done for every transfer. For minor focusing adjustments, use the lens (see #7).</td>
</tr>
<tr>
<td>5</td>
<td>Control Box:</td>
<td>The main power switch is located here. You can tell the entire machine is on when the lights are lit up. The unit’s on/off switch is the square black button on this unit.</td>
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<tr>
<td>6</td>
<td>Projector Knob:</td>
<td>If the projector becomes misaligned on the vertical axis, this knob can raise or lower the entire projector. This is not something that should be necessary very often.</td>
</tr>
<tr>
<td>7</td>
<td>Lens:</td>
<td>To ensure proper focus of your film for transfer, turn the focus ring on the lens. More often than not, this is the most adjustment that will need to be made to the Sniper.</td>
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Sniper 16mm Pro: 16mm Film Conversion Equipment

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<thead>
<tr>
<th>No.</th>
<th>Control Knob:</th>
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<tr>
<td>8</td>
<td>When loading film, turn the knob to STOP. To project, use PLAY. To rewind, use REWIND. Turning this knob to PLAY or REWIND will not start the projector’s motor until the motor button is pressed (see #10).</td>
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<tr>
<th>No.</th>
<th>Red Motor Light:</th>
<th>Instructions</th>
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<tr>
<td>9</td>
<td>When the motor button has been pressed, the red motor light will light up.</td>
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<thead>
<tr>
<th>No.</th>
<th>Motor Button:</th>
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<tr>
<td>10</td>
<td>To run the projector (to play or rewind film), press the motor button. When the control knob (see #8) is set to STOP, the motor will not start. If pressing does not make the projector run, make sure the knob is pointed directly at its label.</td>
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<tr>
<th>No.</th>
<th>Synch Switch:</th>
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<td>11</td>
<td>This switch syncs the projector with the computer through the synch mouse (not pictured). In order to capture frames, the synch switch must be set to ON.</td>
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<tr>
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<th>Gate:</th>
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<td>12</td>
<td>This is the part of the projector through which the frame of film will pass to be captured by the camera (see #3).</td>
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<tr>
<th>No.</th>
<th>Film Reel &amp; Feed Spindle:</th>
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<tr>
<td>13</td>
<td>The film to be digitized should go on the right-hand side of the projector, coming off the Feed Spindle in a counterclockwise direction with the sprocket holes facing outwards.</td>
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<th>Take-Up Reel:</th>
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<tr>
<td>14</td>
<td>After the film travels off its original reel and through the projector, it is wound onto the take-up reel. The projector should turn this reel on its own, but it is a good idea to keep an eye on it during projection.</td>
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### Load Film on the Projector

1. Locate the Control Knob (see #8) on the front of the projector. Switch it to STOP (check that this is STOP, not REWIND), which will change the position of the knobs and rollers nearby. Now your film can be easily slipped into place.

2. Load your reel onto the Feed Spindle (see #13) and lock it into place. Your film should be positioned so that it will come off the reel clockwise, with the sprocket holes facing away from the projector.

3. Gently pull your film from the reel to thread through the knobs and rollers on the face of the projector. If your film does not have leader, you may want to splice some on using Lab supplies. Consult the Small Gauge Film: The Basics.
(http://www.ischool.utexas.edu/technology/tutorials/graphics/film/) tutorial for more information on this process. Also keep in mind when performing this step that your film will need to reach the Take-Up Reel (see #14). Instead of pulling film through the knobs and rollers manually, it’s easier to pull out a length of film that will compensate for that. It may also be useful to pull out enough film so that a frame is visible in the gate immediately.

4. With the Control Knob set to STOP, thread the film through the knobs and rollers along the path illustrated below:

![Path of film with projector in the STOP position.](image1)

From the reel, pull film under the knob with the orange arrow, over the knob to the left (black), over the next knob (white), down to the gate (behind the silver plate), down under the next knob (white), in between the next two knobs (both white), between or under the next two knobs (both white), over the large knob (black), between the next two knobs (both white), and up to the Take-Up Reel.

To secure the tail of the film onto the Take-Up Reel, find the slot on the reel. The film can safely slip into this slot; when wound around the reel, the film stays put because of the friction created. Turn the reel so that the film does not sag between the projector and the Take-Up Reel.

![Film reels have a small slot into which the film can be slipped.](image2)
5. Turn the Control Knob to PLAY. This will change the position of the knobs and rollers so that the film is secured onto its path. Observe this path to be sure the film was threaded correctly; fix any mistakes, but also keep an eye out for areas where the film rubs up against anything that may be harmful.

Notice the differences in the positions of the knobs when the Projector Switch is set to PLAY and STOP. Be sure that the film is secure and will not drag on any rough surfaces.

Path of film with projector in the PLAY position.

6. When you switch the Control Knob to PLAY and turn on the unit’s power (see #5), an LED light will come on at the gate. This LED light replaces the bulb normally found in a projector that can get hot and be harmful to film. With the LED light, we don’t have to worry as much about film burning as a result of being too close to the bulb for too long. For the remaining steps, you should have the projector set to PLAY.

**Preview Film with Dodcap**

1. On the computer, open Dodcap, the software with which you can preview, import, and view the digital video. It is located in the AlternaWare folder in the program files.
2. With Dodcap open, click on the Browse button.

3. This will bring up a Save window.

Locate or create the folder in which you wish to save the video (on the example above, the folder name is "snipervideo"). Create a file name for the video (on the example above, the file name is "descriptive_title"). Dodcap saves in .avi by default. Choose Open when the folder and file names are correct. The file path should now appear in the main Dodcap window.
4. To begin viewing film that has been loaded on the projector, select the Preview button.
This will show a video preview of the image in the gate of the projector:

![Image of video preview](image)

If this image showing parts of two frames, you can “bump” the projector by pressing the Motor Button on and off (see #10). This will synch up the film and show a full frame in the preview window. This is also a good time to test the film’s thread on the projector. If the film gets hung or loose anywhere, doublecheck its path through the knobs and rollers.

![Image of video preview](image)
5. Use the Preview window to adjust the vertical positioning of the frame, the focus, and the light levels (more about these processes below).
6. Leave the Preview window open through the next few steps.

**Adjusting the Camera & Projector**

1. To correct any vertical misalignment between the projector and the camera, simply turn the Projector Knob at the bottom of the projector (see #6). This will raise or lower the projector just a bit.
2. To correct any horizontal misalignment between the projector and the camera, simply adjust the positioning of the camera. To do this, loosen the Adjustment Screws on the white stand supporting the camera. Once the camera is in the proper position, tighten the Screws (slightly) to secure that position. Keep in mind while doing this that the camera will be jostled when tightening the Adjustment Screws, so the process may need to be repeated.

Adjustment Screws can change horizontal alignment on the Sniper.

3. To change the amount of light shining on the film, turn the knob on the light remote, which is connected to the Control Box. Turn the knob on the remote left to lower the amount of light shining on the film, or left to increase the amount of light shining on the film.
4. To bring the image more into focus, rotate the Lens (see #7). It’s a good idea to turn the Lens as far as it will go in both directions so that the image is completely out of focus.
5. The last adjustment to make is on the camera. This will ensure the color settings on the camera are accurate.
   a. Locate the camera settings controls on the side of the camera.
b. Set the switch on the top left to memory.
c. Change gain to 0.
d. Locate the camera settings pane on the lens barrel.

e. Rotate the filter wheel to 4 (this will close the lens).
f. Perform black balance by pressing the black balance button on the camera.
g. Rotate the filter wheel to 1 (this will open the lens).
h. Adjust light with the remote control.
i. Perform white balance by pressing the white balance button on the camera.

6. Doublecheck the image quality in the Preview window. This is how your film will look when it is imported.

**Tips For Capture**

- Keep an eye on the Take-Up Reel. Sometimes it doesn’t know to turn as film is fed through the projector. This can create a real mess of film if left alone!
- During capture, the Preview will look a little blurred and jumpy. This is usually just a feature of capture; your final product will not have these problems if the machine is properly calibrated.

**Capturing Film**

1. Once the image is set, the film is ready, and Dodcap is open, close the Preview window.
2. Click the Begin button. Note: Selecting this option will force the cursor to hover over the Capture icon. The synch mouse connected to the Sniper clicks on the Capture icon each time a frame is captured. For this reason, the cursor will hover over the Capture icon during capture. *To end capture and disengage the cursor, press Alt+E.*
3. Now that the computer is set to capture frames, switch the Synch Switch (see #11) on the projector. This will activate the connection between the projector and the computer.
4. To start the projector (and begin capture), press the Motor Button (see #10). The film should move through the projector at this point. The capture window should show the frames as they are captured. These images will appear blurred, but this should not affect the quality of the captured video.
5. When the film has run through the projector completely, switch off the Synch Switch and turn the motor off and press Alt+E. The capture window will disappear and a dialog box will pop up asking if Dodcap should play the captured footage. Click Yes to do so.

![Question dialog box](image)
Watching the New Digital Video

1. After selecting to view the footage, Dodcap will open up a new Preview window. If it doesn’t, go to Speed Preview -> Choose File. Select the file you’d like to view.

2. Control the playback of the footage with the buttons at the top of the window.
3. If it seems that the playback is too fast, select a Preview Speed that matches the video captured (24 fps usually matches well). Click on Preview Speed and select the desired speed. Selecting one will not prevent another from being selected, so it is ok to try multiple options.

To change the speed at which video is previewed, select Preview Speed.

4. Once you’ve determined which speed is most appropriate for your film, close the Preview window.
Saving and Converting the New Digital Video
Though it may not seem like it while previewing the film, Dodcap is capturing frames upside down. Before the video can be viewed outside of Dodcap, the file must be converted to compensate for this orientation.

1. In the main Dodcap window, go to Speed Change -> Multiple Files.

2. This will bring up a window called Multiple File Speed Change & Effects. On this window, first make sure the Specific Directory points to the directory in which you’d like to save your file. If it’s not, click Browse and navigate to the correct location.
3. To get Dodcap to process the correct file, open the folder in which you’ve saved the file. Drag the icon for that file on top of the frame speed previously determined to be the most appropriate.

4. After the file has been dropped in the right spot on the window, select Process Now.
5. The time it takes to process and convert your file will depend on how big the file is. This could be a long process, so let the computer sit undisturbed until the process is completed.

Rewinding Film on the Projector

1. While the computer works on the video file, take the time to rewind your film. After digitizing, leave the film on the take-up reel, but remove what is still threaded in the projector so that the end of the film is free.
2. Load the end of the film into the slot on the original reel. Turn the reel until the film between it and the take up reel is not sagging.
3. Turn the Control Knob on the projector to REWIND and press the Motor Button. The projector will spin the reel very quickly during this process, so it’s a good idea to keep one hand on the Take-Up Reel as the film is rewound. This will ensure a good pack.
4. Once film is rewound, be sure to turn off the Sniper unit by pressing the power button on the Control Box.