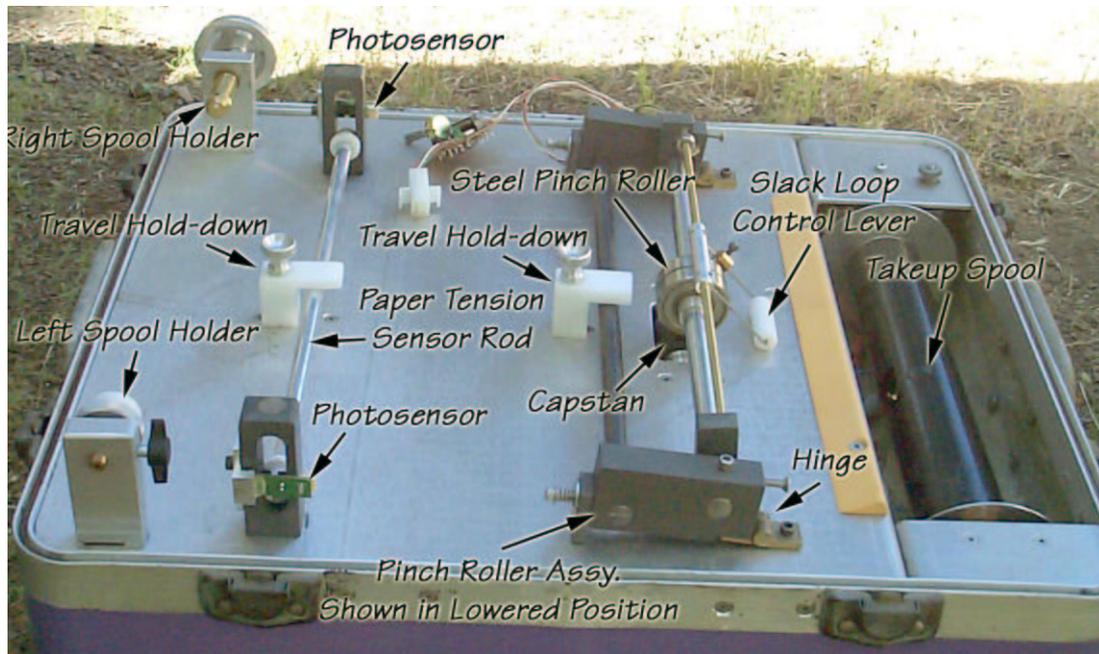


Spencer Chase's Roll Transport Photos and Description



Transport Assembly - Top Side View

Notes about specific features:

1) Slack Loop

A lightweight slack loop control lever rides the paper as it goes onto the takeup spool. It has a nylon(?) roller so that it doesn't grab the paper. The lever operates a vane (shown in other photos) that blocks a photo sensor (opto-interruptor) when it drops far enough, at which time the takeup motor starts to drive the takeup spool. When the lever is raised high enough to clear the opto-interruptor, the takeup motor is stopped. Start and stop times are controlled electronically to ensure that the takeup spool never tugs on the paper. Also, if the paper goes slack for too long, it is assumed that it has torn and the drive system is stopped.

2) Paper Tension Sensor

A lightweight paper tension sensor rod rides on top of the paper as it exits the supply spool. The rod ends have nylon(?) bushings that permit it to rotate freely within its guide slots. As paper tension rises at the supply spool, it lifts the rod. When the rod has risen high enough that it pins extending from its bushings block either of the two photosensors (opto-interruptors) mounted to the rod guides, paper motion is stopped. It is assumed that high paper tension means that either the paper is jammed or the end of the roll has been reached.

3) Spool Holders and Manual Rewind.

The spool holder on the right hand side of the spool (slotted end on most piano rolls) is spring-loaded. A manual rewind knob is attached to the right spool holder.

4) Capstan and Pinch Roller

The paper is driven by a rubber-covered capstan and is held against the capstan by the weight of the pinch roller assembly resting on it. The pinch roller assembly can be raised for paper loading. The pinch roller itself is made from a pair of ball-bearing assemblies, using the steel outer race of the assemblies as the rolling surface.

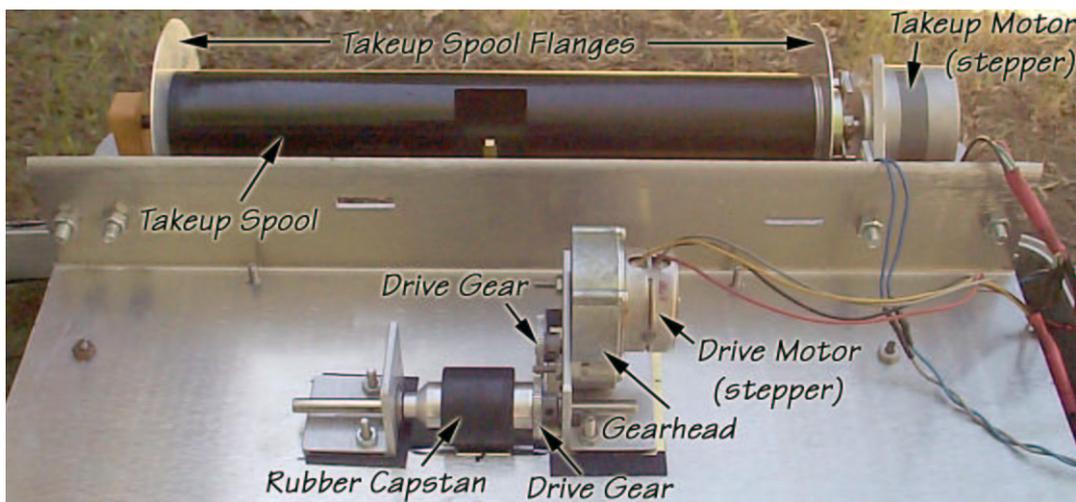
The capstan and pinch roller are relatively narrow (about an inch wide) and are located at the center of the paper path. This arrangement tends to "self-steer". If the paper wanders left or right, the combination of forces acting on it from the supply spool and the capstan/pinch roller tend to gently re-center the paper.

5) Travel Hold-down

To keep parts of the transport from rattling during transport, travel hold-downs are provided for the paper tension sensor rod and the pinch roller assembly. These hold-downs are removed during normal use and are replaced for transport.

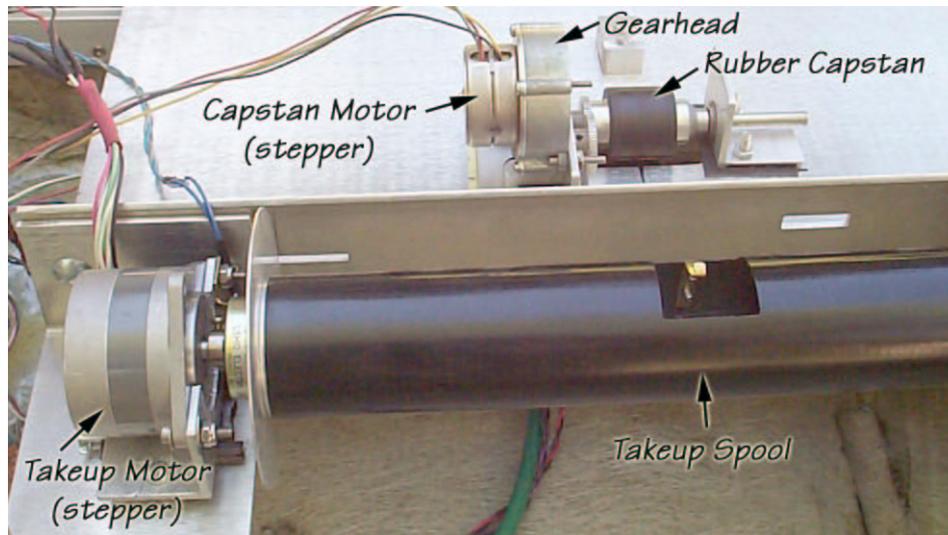
6) Optical Head Assembly (not shown)

The optical head assembly (shown in two photos near the end of this file) goes in the space between the paper tension sensor rod and the pinch roller assembly.



Drive System and Takeup Spool: Bottom Side View

A stepper motor drives the capstan through a gearhead and external drive gears. The takeup motor has a direct-drive stepper motor "slaved" to the capstan drive motor and controlled by the slack-loop lever.

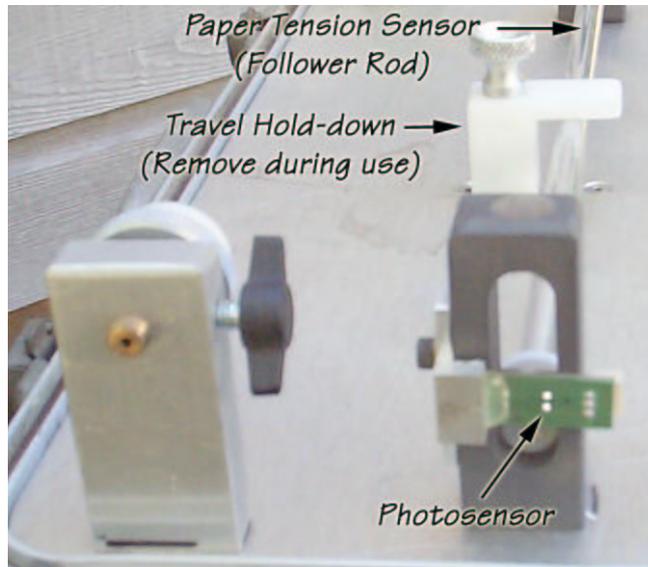


Drive Sytem: Alternate Bottom Side View



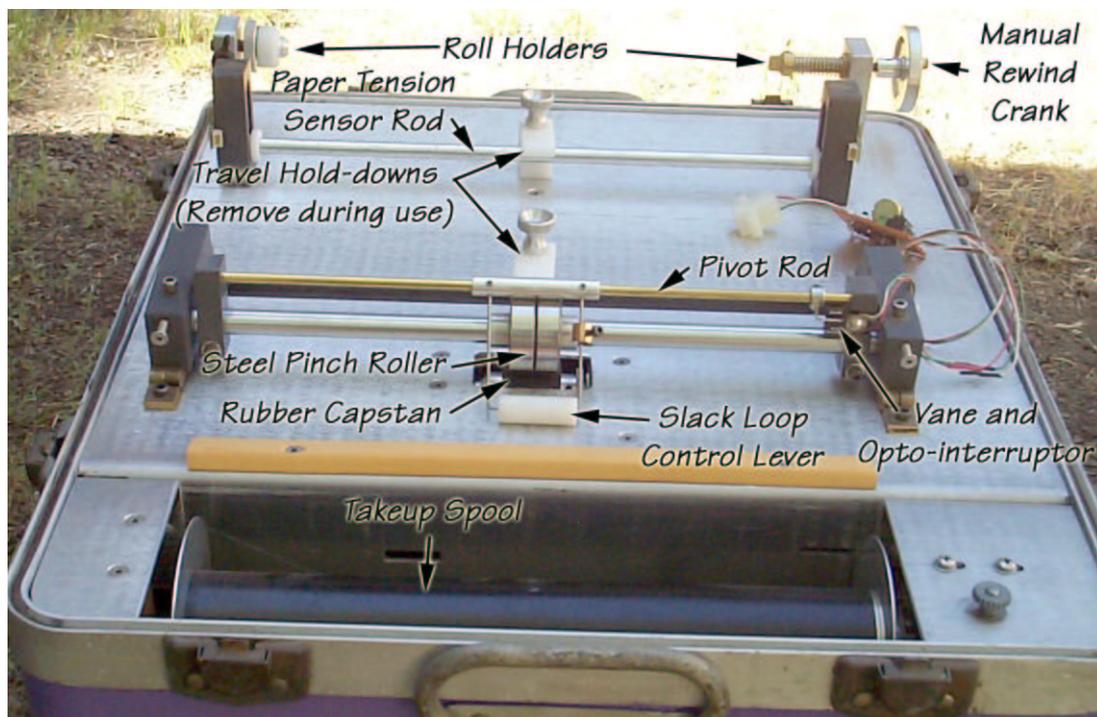
Close-up view of Pinch Roller Assembly and Slack Loop Control Rod

In this photo, the pinch roller assembly is shown in the raised position (for loading the paper). The slack loop control lever has been lifted out of the way, pivoting the pivot rod to expose a vane attached to the pivot rod. When the slack loop rod is lowered sufficiently, the vane blocks a photosensor. The travel hold-down is shown turned to one side. It is removed completely during normal operation.



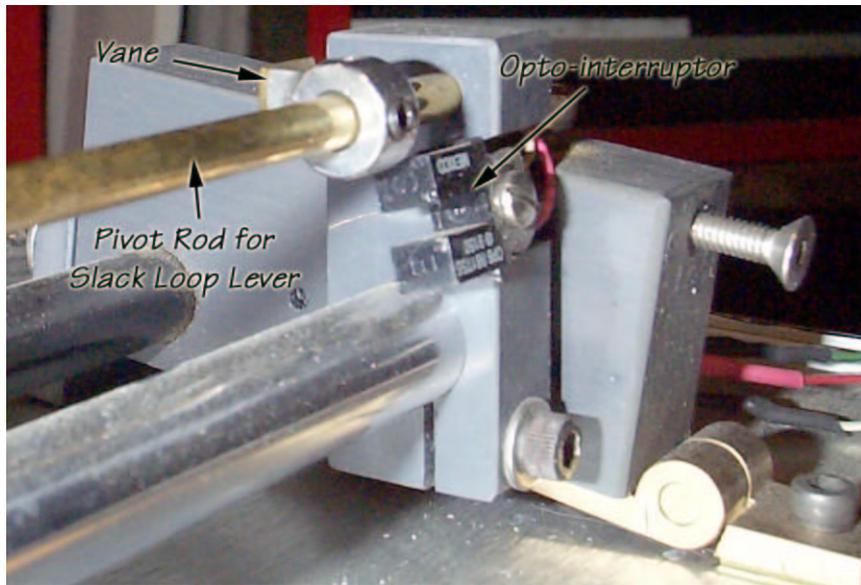
Left end of Paper Tension Sensor

This photo shows a close-up of the left end of the paper tension sensor. The left-end guide slot and photosensor are clearly visible. (Travel hold-down is removed during normal use).

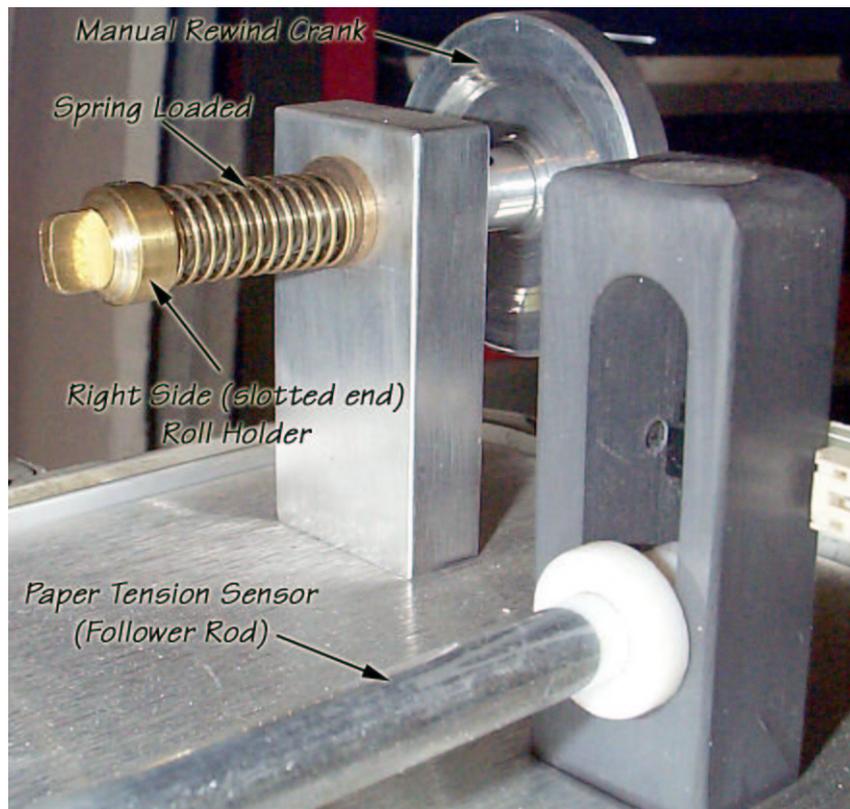


Transport Assembly: Alternate View

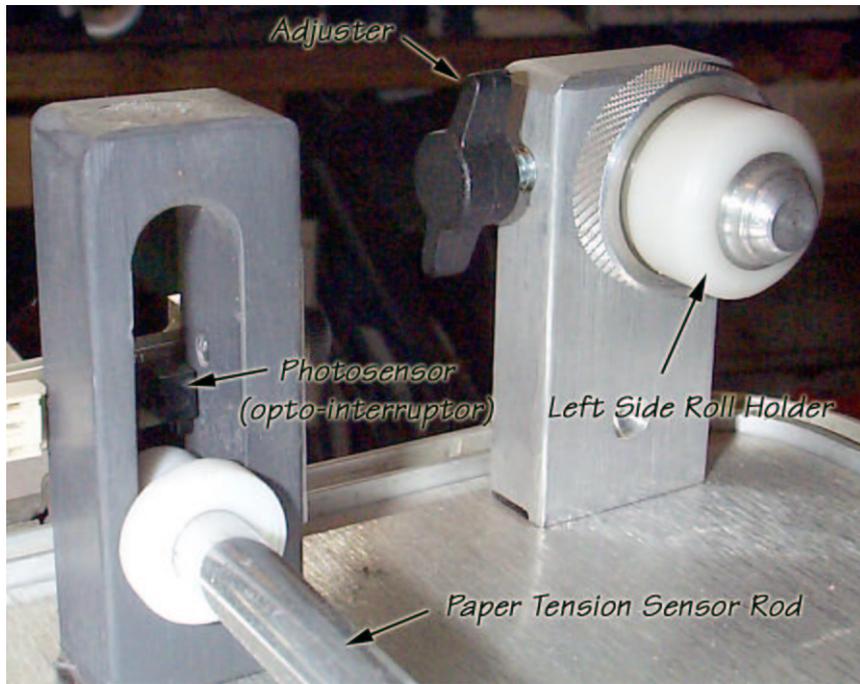
Note the pinch roller assembly and slack loop control lever both in their lowered (operating) positions.



Close-up View of Vane and Opto-interruptor for Slack Loop (control lever raised)



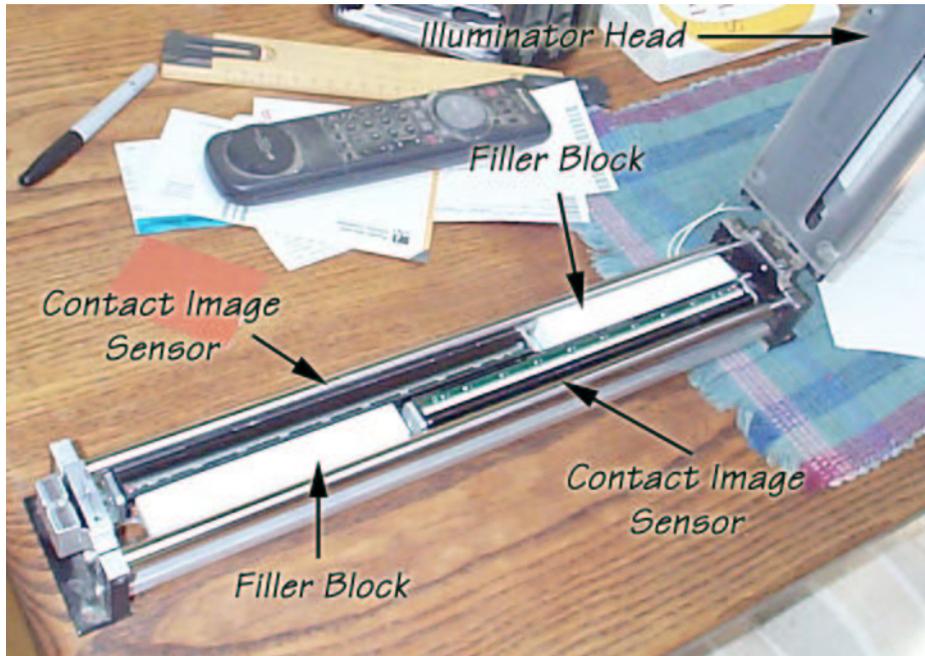
Right-End Spool Holder and Paper Tension Sensor



Left-End Spool Holder and Paper Tension Sensor



Optical Head Assembly (separated from transport)



Optical Head Assembly opened to show offset CIS Modules and Illuminator Head