Full and Half-Rate Carriages

The Exposure Lamp is mounted in the Full-Rate Carriage. Reflected light from the original document is passed via mirrors through a stationary CCD Lens to the CCD PWB. To maintain a constant image size, the distance between the original document and CCD (known as the conjugate) must remain constant. Therefore, an additional Half-Rate Carriage, traveling at half the speed of the Full Rate Carriage, is used.

Half Rate Carriage

Full Rate Carriage

Exposure Lamp
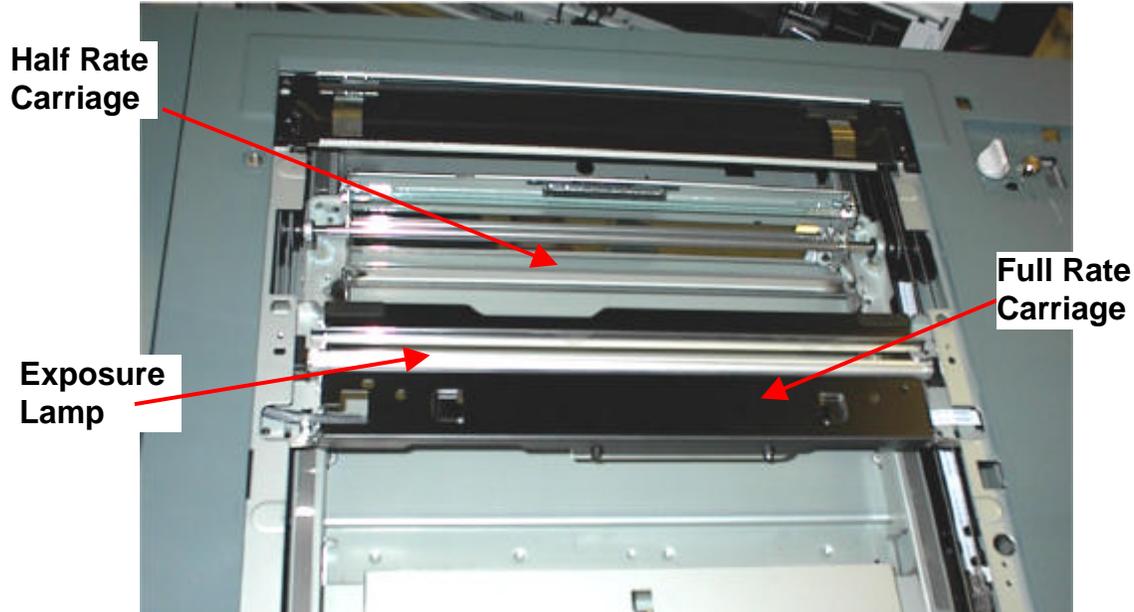
Full and Half-Rate Carriages (continued)

The diagram below shows the carriages and their relative motion to maintain a Constant Optical Path.
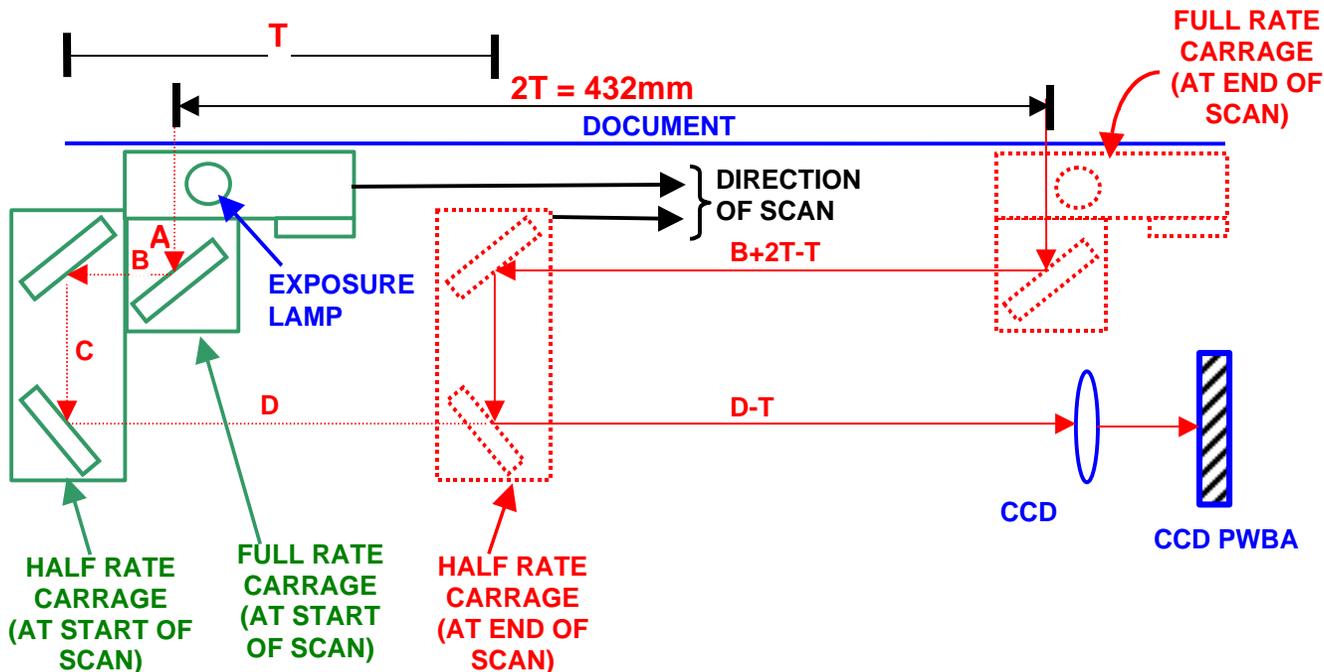
Full and Half-Rate Carriages (continued)

- T is the distance which the Half-Rate Carriage Moves
- 2T is the distance which the Full-Rate Carriage moves
- A is the distance from the original document to the mirror on the Full-Rate Carriage. This distance is constant.
- B is the minimum distance between the Full-Rate Carriage mirror and the top mirror on the Half Rate Carriage. This occurs when the two carriages are at the start of their travel. During carriage travel, this distance increases to a maximum of B + 2T - T=B + T.
- C is the distance between the mirrors on the Half-Rate Carriage, and is constant
- D is the maximum distance between the bottom Half-Rate Carriage mirror and the stationary mirror in front of the CCD PWBA. This occurs when the two carriages are at the start of their travels. During carriage travel, this distance decreases to a minimum of D -T. At the start of carriage travel, the conjugate is A + B + C + D. At the end of carriage travel, the distance is A+ (B + 2T- T) + C + (D - T) = A + B + C + D.