

FIGURE 3. SINGLE INDEX POINT DISK

wheel, system noise or a slight movement will imbalance the equal photodiode currents and the higher current sensor will receive even more light. This causes the wheel to seek the desired index point. Masking of the wheel at an angle to the radial softens the control function and prevents overshoot.

**SPOT SIZE**

Optimum relationship of beam size to active areas of the photodetectors is shown in Figure 4. A centered beam should illuminate half the photosensitive area of each diode. Too large a beam will produce no change of sensor output for a range of positions, while a smaller beam will produce a nonlinear transfer function near the center line between the photosensitive areas. This makes selection of  $C_F$  to dampen the circuit difficult and requires a higher intensity light source.

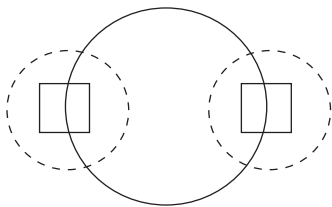


FIGURE 4. BEAM-SENSOR ALIGNMENT

**DIGITAL INTERFACING**

For systems with digital control, Figure 5 illustrates a method not requiring generation of bipolar control signals thus saving the cost of digital to analog conversion. When logic lines are low, the signal diodes will not conduct. This condition leaves control to the photodiodes. A high level on line 2 will cause current to flow to the summing junction and the amplifier will swing negative. A high level on line 1 will raise the summing junction voltage above ground, and the amplifier will swing positive. Select a resistance value such that a high logic level will provide at least twice the maximum current from each photodiode to insure control override regardless of photodiode signals.

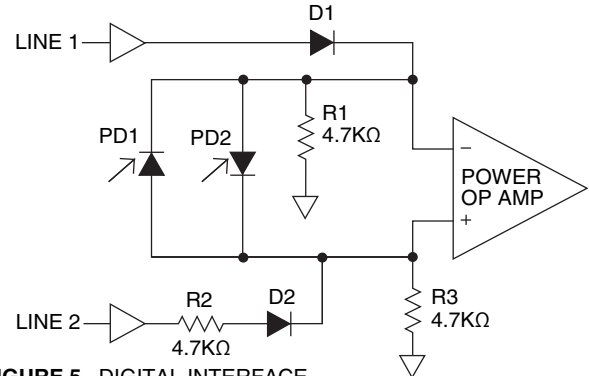


FIGURE 5. DIGITAL INTERFACE

**DUAL SENSORS**

For applications requiring high precision, the use of a dual element position sensing PD1 (Figure 5) will allow smaller beam size, tighter beam control and provide better thermal equilibrium. The specified resolution of the detector recommended for this application is better than .0127mm (.0005 inch). The detector is a three terminal device requiring a current inverter as shown in Figure 6 to achieve the differential configuration. Two equal resistors, R1 and R2, should be scaled to the maximum photodiode current and swing capability of the signal amplifier.

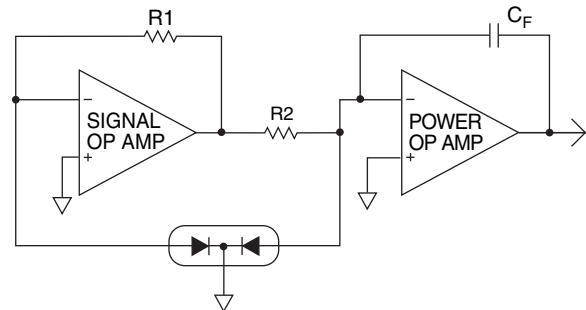


FIGURE 6. CURRENT INVERSION

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## CONTACTING CIRRUS LOGIC SUPPORT

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