CLAROSTAT
SENSORS AND CONTROLS GROUP

SKAN-A-MATIC®

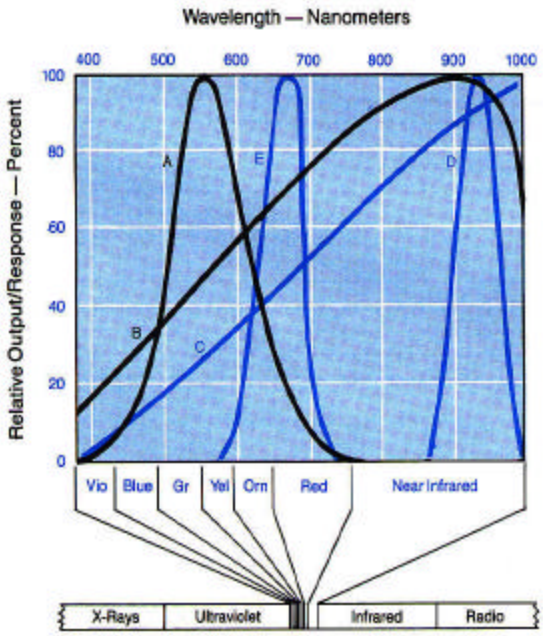
TECHNICAL INFORMATION

Components of a Photoelectric System

Skan-A-Matic thrubeams and skanners are photoelectric devices — they react to the presence or absence of light by changing their electrical characteristics. A working system has three basic parts: a light source, a light detector or photodetector, and an amplifying control. These three components may be packaged and arranged in different ways for different applications.

Light Sources

Light sources can be either Incandescent Lamps or Light Emitting Diodes (LED's).



A Human Eye
B Photodetector
C Lamp
D IR LED
E Visible red LED

FIG. 1

Lamps

INCANDESCENT LAMPS are miniature versions of the common household light bulb — electric current heats a metal filament until it glows. Although most people see only the blue thru the red wavelengths, the energy emitted by an incandescent lamp is a blend of all colors, including infrared. As Fig. 1 shows, the lamp emits most of its energy in the infrared region of the spectrum.

Features

- High output — important for small, rapidly moving, or distant targets
- Wide band emission — essential for distinguishing colors
- Visible light — easier installation and alignment

Limitations

- Waste heat — degrades other electronic components
- Filaments are vulnerable to shock and vibration — may break or may move off-axis
- Filaments degrade over time (approximate life — 10,000 hours at rated voltage)
- Cannot be modulated

LED 's

LIGHT EMITTING DIODES are semiconductor devices that emit light when an electrical current is passed thru them. Unlike lamps, they do not have a filament to burn out and therefore have much longer life. Two types of LED's are used in Skan-A-Matic products. The infrared LED, and the visible red LED. Infrared LED's have the greater output, but have the disadvantage of being invisible to the human eye. Sensors made using visible red LED's have the advantage of being easy to install, because the light source can be seen.

LED's must always be wired using the correct polarity and a current limiting resistor must be used in most cases. Always consult the installation instructions for the particular skanner and control being used. In all cases where a resistor is necessary it will be supplied with either the skanner or control.