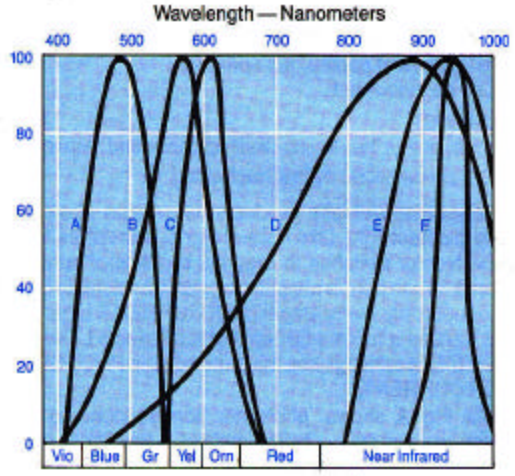
TECHNICAL INFORMATION

Spectral Response S35 Series Color Skanners



A Red Color Skanner S35201
B Visible Color Skanner S35203
C Blue Color Skanner S35202
D Any Unfiltered Incandescent Skanner
E Incandescent Skanner with IR Filter
F LED Skanner

FIG. 2

because silicon phototransistors react most strongly to infrared wavelengths, the reflectivity of a surface at infrared wavelengths controls the skanner's signal. An object which appears dark to our eyes, for example, might appear very bright to a skanner if the object's surface is a good infrared reflector.

There is however, a solution to the problem. Skan-A-Matic's S35 Series "Color Skanners" are designed to detect colored marks. They cannot distinguish between colors, but can detect a mark of predetermined color against a contrasting background. Special filters are used to exclude infrared wavelengths to which a photodetector responds most strongly. This means incandescent lamps must be used for their high output and wide-band visible light. The photodetector current must also be amplified within the skanner since the response to visible wavelengths is poor.

Colored marks are usually made to appear dark against their background. For example, a skanner designed to detect blue includes a filter which blocks blue but passes red wavelengths. The mark seems blue to us because it reflects blue wavelengths and absorbs other wavelengths. When the skanner filter absorbs the blue wavelengths, very little light is left and the mark appears black to the skanner. The contrasting background however, will reflect some red light which passes the filter and is detected. A "red mark" skanner has a filter which blocks red but passes blue wavelengths. Refer to Fig. 2.

Controls

A control is the third part of a working photoelectric system. Controls perform two essential functions: amplification and switching.

When a photodetector is darkened, it conducts so little current that it is virtually an open switch. Yet, even when the photodetector is illuminated, current flow is a few milliamps at best and more likely is only a few hundred microamps. These currents are too weak for jobs like turning on power transistors, solid state relays, or relays so they must be boosted up to useful levels by an amplifier.

Most controls pass the input signal thru a resistance-capacitance (RC) network. The RC network acts as a filter to suppress transient noise before it is amplified. The filter gives the control enough noise immunity so that it responds to real signals but not to the electrical noise emitted by motors, switches, and other industrial equipment.

Amplifiers used in Skan-A-Matic controls are based on integrated circuits called operational amplifiers, or op amps.

The op amps can be configured to form a device called a Schmitt trigger which produces a two-value output — either a high or low voltage. Current flowing in the photodetector circuit passes through a potentiometer (pot) which determines the sensitivity of the control. The Schmitt trigger monitors the voltage produced across the sensitivity

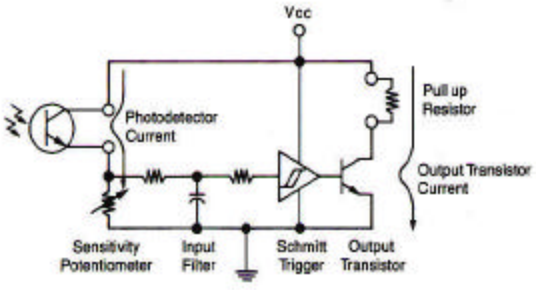


FIG. 3