Light Event Detector (LED) Description:

The LED is an infrared pulse sensor with peak sensitivity in the 1-3 micron region. The LED consists of an enclosure containing an IR Fresnel lens, a lead-sulfide thermal IR detector, and a two-stage amplifier. The LED receives power from a host device such as the SCU over co-axial cable up to 500 feet long, and uses the same cable to return signals to the host device. A barrel is threaded into the C-mount faceplate to restrict entrance of sunlight and other off-axis light. A snap-in cap fits into the end of the barrel to attenuate strong signals and prevent damage to the lens from blast pressure during close-in work. A sighting groove along the top of the enclosure assists in alignment. A captive ¼-20 nut allows tripod mounting. There are no user adjustments or jumpers inside the LED.

Light Event Detector (LED) Circuit Operation: (Refer to the LED Component Location and Schematic on Page 4)

The lead-sulfide detector is connected to a load resistor R18 through jumpers J1 and J2, which are present to accommodate various detector types. The low-level pulse from the detector is next amplified by an AC coupled amplifier consisting of transistors Q6, Q7, and Q8. Feedback through R10, C5, and Q8 creates a high-pass response immune to changes in ambient light. The amplified pulse is further amplified by a similar amplifier consisting of transistors Q3, Q4, and Q5. Feedback through R2, C2, and Q5 creates a high-pass response which is modified during trigger detection by transistor Q2.
The final amplified output is divided by resistors R4 and R5 to provide threshold detection by output driver transistor Q1. A detected signal causes Q1 to pull low the normally 5VDC level on CON1 thus triggering a host device such as the SCU. Since the detected signal is transient, the level on CON1 returns high to continue supplying power to the amplifiers via diode D1 and capacitor C1.

LED Component Location and Schematic: