Mid- and Long-Wave Infrared Thermal Identification System

CDT Bryan C. Bird
United States Military Academy
West Point, New York

LTC Gregory Kilby, PhD., LTC John M. Ingram
Photonics Research Center, USMA
West Point, New York

ABSTRACT:

A mid- and long-wave infrared thermal identification device has been developed using the unique thermal properties of pyrolized Kapton®. When Kapton, an inexpensive plastic material available from DuPont™, is exposed to focused laser light, the Kapton pyrolizes forming a conducting filament. Current passed through the filament results in strong emission in the mid- and long-wave infrared spectrum. At these wavelengths, the filament is visible to sophisticated state-of-the-art U.S. and coalition force mid- and longwave IR imagers, yet is not visible through the older thermal sites most commonly possessed by our adversaries. A team at the United States Military Academy has developed and tested a prototype identification system using the simple, low cost thermal emitters. Several emitters are attached to common individual solider equipment and are programmed to emit for signaling or identification purposes. Simple drive circuitry enables the user to select the desired flash pattern for the system. Future work includes extending the range of the devices. Collaboration and material support is necessary to continue the work.

KEYWORDS: Pyrolyzed Kapton®, Active Infrared Transmitter, Thermal Night Vision Devices,

CONTACT: CDT Bryan C. Bird, United States Military Academy, West Point, NY, Tel: (845) 515-4847, E-mail: Bryan.Bird@usma.edu

LTC Gregory Kilby, Photonics Research Center, United States Military Academy, West Point, NY, Tel: (845) 938-5565, E-mail: Gregory.Kilby@usma.edu

LTC John M. Ingram, Photonics Research Center, United States Military Academy, West Point, NY, Tel: (845) 938-5565, E-mail: John.Ingram@usma.edu