ABSTRACT

Jamming endangers communication systems of flying devices, e.g., drones, guided missiles, and aircraft. Anti-jamming technique is important to avoid a great danger if dropped or misused. This undergraduate thesis designs anti-jamming technology for flight device communication systems using active and passive anti-jamming.

Active anti-jamming is designed using the technique of frequency hopping spread spectrum (FHSS) with Gaussian frequency-shift keying (GFSK) modulation. Meanwhile, passive anti-jamming is designed using an electromagnetic shielding fabric as protection for communication devices. The electromagnetic shielding fabric used is a carbon-reinforced polymer and silver-plated fiber functional fabric to face jamming in the industrial, scientific, and medical (ISM) bands. The active anti-jamming technology was tested by computer simulation with single tone jamming and multi-tone jamming, while the passive anti-jamming technology was tested using the shielding box method.

This undergraduate thesis produces: (i) a communication system design with active anti-jamming to be applied in the field with a good bit error rate (BER) performance without error-floor and (ii) a passive anti-jamming design that has shielding effectiveness (SE) which indicates the signal attenuation capability. The results of this undergraduate thesis are expected to be useful for the development of anti-jamming in flying device communication systems.

Keywords: *anti-jamming*, *shielding effectiveness*, *frequency hopping*, AWGN, *single tone jamming*, *multi tone jamming*.