

## ABSTRACT

Communication systems on devices at high speed have an error-floor due to the Doppler effect causing frequencies and phases shift and change during movement. This Thesis proposes a simple narrowband communication systems for high-speed mobile devices (SKN-PKT) for applications such as missile, drone, and airplane. This thesis proposes increasing the number of pilot symbols so that the channel estimator can be more accurate in predicting the fast-changing channel due to time-selective fading channel. The equalizer in this thesis is designed according to the addition of the pilot symbol so that the signal can still be received by the receiver at a maximum speed of 450 km/h.

Computer simulations are used to evaluate the performance of the proposed SKN-PKT. The frequencies used are industrial, scientific, and medical (ISM) band simulated with a computer with binary phase shift keying (BPSK) modulation and repetition codes as channel coding.

The results of this Thesis are: (i) simple communication systems design for high speed flying devices, (ii) communication systems characteristics in term of good bit error rate (BER) performances. The results of this study are expected to be useful for the development of simple communication systems for missile, drone, and aircraft applications in the future.

Keywords: **Doppler effect, equalizer, pilot symbol, BPSK, repetition codes**