

ABSTRAK

PERANCANGAN *PROTOTYPE* SISTEM MONITORING GEMPA MENGUNAKAN SENSOR *INERTIAL MEASUREMENT UNIT* (IMU) DAN PEMANFAATAN METODE *FREQUENCY SHIFT KEYING* (FSK) MELALUI FREKUENSI *HANDY TALKY* (HT)

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Indonesia termasuk dalam lingkungan cincin api (*ring of fire*) yang memiliki potensi bencana alam cukup tinggi. Beberapa data yang diperoleh BMKG (Badan Meteorologi, Klimatologi dan Geofisika) menunjukkan bahwa aktivitas gempa bumi di Indonesia tergolong sangat aktif. Gempa besar yang terjadi pada 30 september 2009 di Sumatera Barat menyebabkan saluran komunikasi dan listrik terputus sehingga warga sulit untuk memperoleh informasi gempa susulan. Alat komunikasi yang dapat aktif tanpa harus terhubung arus listrik adalah *Handy Talky*. *Handy Talky* digunakan sebagai media transmisi data getaran dan ayunan sensor IMU (*Inertial Measurement Unit*) dari *transmitter* ke *receiver* secara *point-to-point*. Oleh karena itu, dibuat sebuah *prototype* untuk memonitoring gempa melalui komunikasi HT (*Handy Talky*) dengan pemanfaatan metode FSK (*Frequency Shift Keying*). Metode FSK digunakan karena amplitudonya stabil dan frekuensinya dapat diubah-ubah, sehingga kebal terhadap *noise*. Dari hasil pengujian, *Handy Talky* dapat berkomunikasi *half-duplex* sejauh 3,5 km sedangkan untuk transmisi data secara *real time* dan efisien terbatas pada jarak 2,5km.

Kata kunci : *ring of fire*, IMU, *Handy Talky*, FSK

ABSTRACT

THE PROTOTYPE DESIGN OF EARTHQUAKE MONITORING SYSTEM USING INERTIAL MEASUREMENT UNIT (IMU) SENSOR AND THE UTILIZATION OF FREQUENCY SHIFT KEYING (FSK) METHOD VIA HANDY TALKY (HT) FREQUENCY

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Indonesia is lying among the Ring of Fire area which has high potential in natural disasters. Some of data from BMKG (Bada Meteorologi, Klimatologi dan Geofisika) indicates that the earthquake activity in Indonesia is very active. The major earthquake in 30th September 2009 in west Sumatra causing the electricity and communication cut off, so people difficult to access the information about the possibility of further earthquakes. One of communication tool which can be active without connected to electricity is Handy Talky. Handy Talky is used as a transmission media of vibration data and swing data of IMU sensor (Inertial Measurement Unit) from transmitter to receiver from point-to-point. Therefore, is made a prototype for earthquake monitoring via Handy Talky communication using FSK (Frequency Shift Keying) method. FSK method is used because the amplitude is stable and the frequency can be changed so it is invulnerable to noise. From the result of the test, conclude that Handy Talky can be communicate in half-duplex about 3.5 km while transmission data in real time and efficient limited in 2.5km.

Keyword : ring of fire, IMU, Handy Talky, FSK