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PAKDEE WORAPAIN :A VARIABLE SWITCHING FREQUENCY INVERTER FOR MOTOR DRIVE APPLICATIONS.
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This thesis presents a design and implementation method of a variable switching frequency inverter. The aim of this research is to reduce the annoyance caused by acoustic noise from a motor driven by an inverter with a fixed switching frequency. By using a fixed switching frequency inverter, the noise tends to occur at switching frequency and its multiples. By varying switching frequency in such a way that the harmonic current spectrum is well spread in a wide frequency range, the noise does not seem dominant at any particular frequency. Then the sound is less annoying. This thesis looks for an appropriate switching frequency pattern, and the optimum subcycle method was used to minimize the current harmonic content. It was found that when the modulation index equals 1, the current harmonic spectrum was also well spread. It was suggested that this frequency pattern be used for other modulation index values in order to maintain the spreading of the spectrum. This pattern can be approximated to an absolute sine function which is easier to implement. The implementation was carried out by using a 16 bit microcontroller to generate PWM signals and to control the overall system. Experimental results confirmed the suitability of the proposed system.

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