DEPARTMENT OF ELECTRICAL ENGINEERING

UNIVERSITY TEKNOLOGY MARA

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FINAL REPORT OF DIPLOMA PROJECT
BATTERY AND DC TO AC INVERTER

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ABSTRACT

This project is valuable and acceptable for a daily use and also for an emergency case like blackout. This project is called power supply (source-part). It required some common electric and electronic devise, such as transformer inverter, transistor, capacitor, resister etc.

Our project is suitable to use for any electrical devise. This is because our supply comes from a car battery. The input supply is 12V dc and our output is $\pm$230V ac. We use the dc to ac inverter circuit to convert the voltage supply from input dc to output ac. From our part the output will be input to our member's part. There are many benefit can we get from this power supply because we just take a car battery for their source. A car battery are easy to find and it also suitable to use. It will make our life even easier.

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1.1 INTRODUCTION

Background

Battery

A battery, in concept, can be any device that stores energy for later uses. A rock pushed to the top of a hill, can be considered a kind of battery, since the energy used to push up the hill (chemical energy, from muscles or combustion engines) is converted and stored as potential kinetic energy at the top of the hill. Later, that is released as kinetic and thermal energy when the rock rolls down the hill. Common use of the word,"battery," however, is limited to an electrochemical device that converts chemical energy into electricity, by use of a galvanic cell. A galvanic cell is a fairly simple device consisting of two electrodes (an anode and a cathode) and an electrolyte solution. Batteries consist of one or more galvanic cells.

A battery is an electrical storage device. Batteries do not make electricity; they store it, just as a water tank stores water for future use. As chemicals in the battery change, electrical energy is stored or released. In rechargeable batteries this process can be repeated many times. Batteries are not 100% efficient –some energy is lost as heat and chemical reactions when charging and discharging. If we use 1000 watts from a battery, it might take 1200 watts or more to fully recharge it. Slower charging and discharging rates are more efficient. A battery rated at 180 amp-hours over 6 hours might be rated at 220 AH at the 20-hours rate and 260 AH at the 48-hour rate. Typical efficiency in a lead-acid battery is 85-95%, in alkaline and NiCad battery it is about 65%. Practically all batteries used in PV and al but the smallest backup system are Lead-Acid type batteries. Even after over a century of use, they still offer the best price to power ratio. A few systems use NiCad, but we do not recommend them expect in cases where extremely cold temperatures (-50 F or less) are common. They are expensive to buy, and very expensive to dispose of due the hazardous nature of Cadmium. We have had almost no direct experience with the NiFe (alkaline) batteries, but from what we have learned from others we do not recommend them-one major disadvantage is that there is a large voltage difference between the fully charged an discharged state. Another problem is that they are very inefficient- you lose from 30-40% in heat just in charging and discharging them. Many inverters and charge controls have a hard time with them. It appears that the only current source for new cells is from Hungary. It is important to note here that all of the batteries commonly used in deep cycle applications are Lead-Acid. This includes the standard flooded (wet) batteries, gelled, and AGM. They all use the same chemistry, although the actual construction of the plates etc can vary considerably. NiCad ,nickel-Iron, and