VitaNexis Compact Portable AED*

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Description

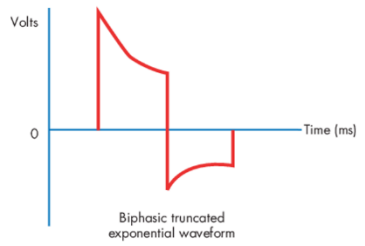
The Automated External Defibrillator (AED) is a portable device that analyzes heart rhythm and delivers an electric shock to correct severe arrhythmias like ventricular fibrillation.

Operating Principle:

- Heart rhythm analysis: Monitors and analyzes the patient's heart rhythm.
- Detection of severe arrhythmias: Identifies serious arrhythmias requiring intervention.
- Delivery of electric shock: Administers an electric shock to restore normal heart rhythm if needed.

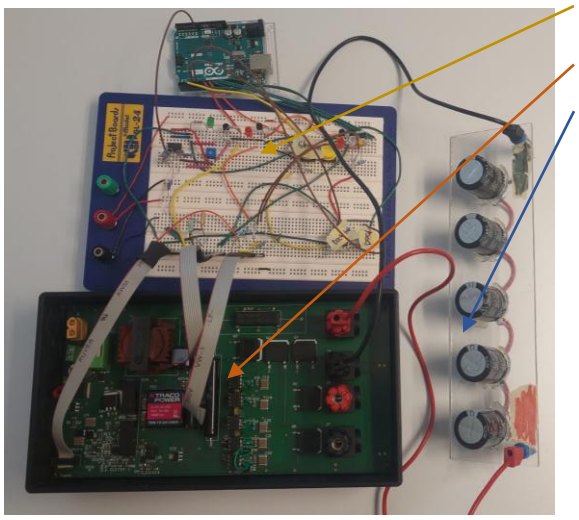
Objectifs

The VitaNexis project aims to develop a compact, portable AED for rapid intervention in sudden cardiac arrests within two minutes. Objectives include designing a high-voltage defibrillation circuit demonstrator within the size of two stacked smartphones. An in-depth study has defined the circuit's prerequisites, inputs, and outputs. The demonstrator will use a biphasic truncated exponential waveform with a maximum voltage of 2kV and variable energy up to 270J, allowing modification of the shock wave timing

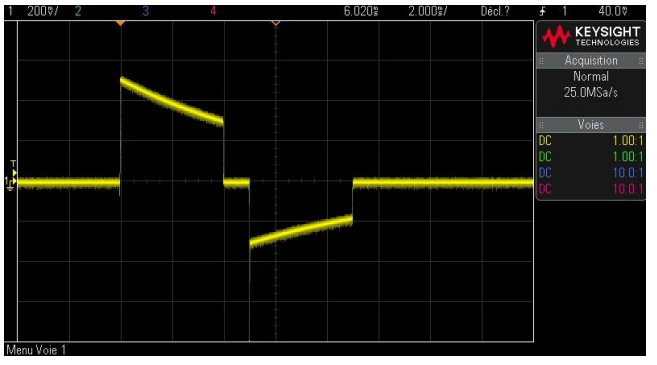


Résultats

The implementation and initial tests of the circuit validated the design and sizing. Critical components, such as the flyback controller and transformer, were identified. Results showed successful delivery of a 520V shock with a biphasic truncated exponential waveform. Design and schematic issues were identified for direct improvements. Verifying the "phantom" circuit's operation is a significant advance, enabling safe and accurate testing of future project versions.



Output Signal @ 520V



Discussion : Conclusions et perspectives

The established theoretical and practical foundations provide a solid basis for the future development of the VitaNexis portable defibrillator. The next steps will involve finalizing the design, conducting thorough testing, and integrating identified improvements, with the ongoing goal of making the device accessible, safe, and effective for the general public.

*Rapport écrit en français