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# **The Design of an Electric Fence Fault-Finder**

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requirements for the degree of Master of Engineering  
in Computer Systems Engineering at Massey  
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# Abstract

Electrified fencing is commonly used throughout the world to control animals with smaller and cheaper fence constructions than would otherwise be necessary with non-electrified wires. Typical installations have a long wire or wires starting from an electric fence energiser and then surrounding fields in various complex configurations. Faults on electric fences can be difficult to locate, with the average fence using tens of kilometres of wire.

Basic fault-finding tools allow an operator to read the peak fence voltage, requiring the user to decide whether a fault is present and to randomly search for the source of the problem. The focus of this thesis is to develop a device that reduces the time to locate faults on a fence by providing more information about the location and nature of a fault, and will point in the direction of the fault.

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# Symbols and Abbreviations

F	Frequency [ $s^{-1}$ ]	V	Voltage
Hz	Hertz [ $s^{-1}$ ]	$V_{out}$	Voltage Output
kHz	Kilohertz [ $s^{-1}$ ]	$V_{in}$	Voltage Input
MHz	Megahertz [ $s^{-1}$ ]	mV	Millivolt
		kV	Kilovolt
E	Stored Energy [J]	$V_p$	Peak Voltage
L	Inductance [H]	$V_{RMS}$	Voltage, Root Mean Square
H	Henry		
mH	MilliHenry	I	Current [A]
C	Capacitance [F]	$I_{out}$	Current Output [A]
Q	Capacitor charge	$I_{in}$	Current Input [A]
F	Farad	A	Amp
pF	PicoFarad	$\mu A$	MicroAmp
nF	NanoFarad	mA	MilliAmp
$\mu F$	MicroFarad	$I_p$	Peak Current
G	Conductance		
R	Resistance [ $\Omega$ ]		



t	Time [s]
s	Second
ms	MilliSecond
μs	MicroSecond
km	Kilometre
m	Metre
cm	Centimetre
h	Height [m]
r	Radius [m]
A	Area [m <sup>2</sup> ]