

PERFORMANCE ANALYSIS BETWEEN OF
BUTTERWORTH AND CHEBYSHEV FILTER FOR
RADAR APPLICATION

NORATIKA BT MOHAMMAD SOMARI

FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
MALAYSIA

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ABSTRACT

In communication system, noise is one of the main factor that limit the capacity of data transmission on the accurateness of signal measurements. Noise is exists in communication channels and need to be recovered. This paper analyzed the performance of Butterworth and Chebyshev Filter in order to removed noise from radar signal. Simulated signal for three different frequencies (64MHz, 151MHz and 434MHz) are added with noise where signal to noise ratio is from 0dB to 30dB. By applying different numbers of cut off frequency, the effectiveness of the filters has been analyzed. From the result, it can be concluded that Butterworth filter is suitable for radar application.

TABLE OF CONTENTS

CONTENS	PAGE
APPROVAL	i
DECLARATION	ii
AKCNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS	v
LIST OF FIGURES	vii
LIST OF TABLES	viii
LIST OF EQUATION	viii
LIST OF ABBREVIATIONS	ix
 CHAPTER 1	
INTRODUCTION	
1.1 BACKGROUND OF STUDY	1
1.2 PROBLEM STATEMENT	2
1.3 OBJECTIVES OF RESEARCH	2
1.4 SCOPE OF WORK	2
1.5 SIGNIFICANCE OF RESEARCH	3
1.6 THESIS ORGANIZATION	3
 CHAPTER 2	
LITERATURE REVIEW	
2.1 INTRODUCTION	4
2.2 INTRODUCTION OF RADAR	4
2.2.1 Radar Application	6
2.3 NOISE	8
2.4 SIGNAL TO NOISE RATIO (SNR)	10

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Noise is unwanted electromagnetic energy which interferes with the ability of the receiver to detect the wanted signal. It may originate within the receiver itself, or it may enter via receiving antenna along with the desired signal. If the radar were to operate in a perfectly noise-free environment so that it did not generate any excess noise, there would exist an unavoidable component of noise generated by the thermal motion of the conduction electrons in ohmic portions of the receiver input stages[2].

The basic idea behind radar is to send out a signal and analyze the return signal. For range processing, the return signal must first be filtered in order to reduce the effects of clutter and noise that get into the signal due to buildings, mountains, machinery, and other signals. The noise target disturbs the target identification in the display screen, which causes the illusion the target fluttering [3]. Filtering is a class of signal processing, the defining feature of filters being the complete or partial suppression of some aspect of the signal. Most often, this means removing some frequencies and not others in order to suppress interfering signals and reduce background noise[4]. In time varying system, all information is difficult to acquire, or is inaccurate, leading to worse result for data of detail section[1].