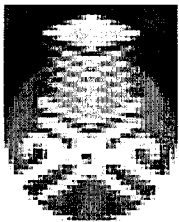


HARDWARE SIMULATION OF m-SEQUENCE GALOIS PN CODE GENERATOR IN WCDMA SYSTEM

This project report is presented in partial fulfillment for the award of the
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TABLE OF CONTENTS

TITLE	PAGE
TITLE OF PROJECT	i
APPROVAL SHEET	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
TABLE OF CONTENTS	v-vii
LIST OF FIGURE	viii-ix
LIST OF ABBREVIATION	x-xi
CHAPTER 1	
1.1 Introduction	1
1.2 Project Overview	1
1.3 Scope of Project	2
1.4 Project Requirements	2
CHAPTER 2	
2.1 Theory of PN Codes	3
2.2 Properties of PN Codes	4
2.3 PN Code Generator	5
2.3.1 Types of PN Code Generator	5
2.3.1.1 m-Sequence	5
2.3.1.2 Gold Codes	6
2.3.1.3 Kasami Codes	6
2.4 m-Sequence PN Generator	7
2.4.1 Galois Implementation	8
2.4.2 Fibonacci Implementation	9

ABSTRACT

This paper highlights the development of 42-Stages m-Sequence Galois PN Code Generator for WCDMA system. WCDMA is one of the 3G (Third Generation) platforms and it is a spread spectrum technology that enables multiple users to occupy the same radio channel or frequency spectrum. The main utilizations of WCDMA system are in point-to-point communication and satellite communication as well as by the military.

In WCDMA, all users transmit their data simultaneously, so the unique PN Code is being used in order to differentiate the user from the other user.

CHAPTER 1

INTRODUCTION

1.1 Introduction

PN codes are the core part of every Spread Spectrum system [2]. Spread spectrum communications, long a favorite technology of the military because of its resistance to interception and jamming, is now being used in commercial applications. Digital cellular phones, personal communication systems, alarm systems, police radio and radar are just a few of the common application.

The purpose of spread system is to improve the bit error rate in the presence of noise and interference. This is achieved by spreading the original signal (information signal) over a PN code where the frequency range greater than the minimum bandwidth required for information transmission. The two most common types of spread spectrum technology are Direct Sequence and Frequency Hopping.

To design, build or understand a spread spectrum system requires a working knowledge of and through insight into these somewhat “mystical” codes.

1.2 Project Overview

This project aims to develop the hardware simulation of 42-stages m-Sequence Galois PN code generator to generate a random code sequence for Wideband Code Division Multiple Access (WCDMA) system. This PN code generator using the Galois implementation of Linear Feedback Shift Register (LFSR), the algorithm, and formula related to WCDMA-Direct Sequence. WCDMA networks allow multiple users to transmit simultaneously within the same wideband radio channel. In order to enable frequency re-use, the networks employ the spread spectrum technique. In WCDMA, the narrow band message is multiplied by a large bandwidth signal, which is a PN codes.