Dedication

I dedicated this work to my wife, Faiha, for her steadfast support, understanding, and patience.
Acknowledgment

First, praise is to Alla, the first cherisher substainer of the world, Acknowledgments Sea ports Corporation, Sudan University of Science & Technology, Communication Engineering teachers, I'm indebted to all of them because of their support and device.

They were all patient and generous in helping. Special acknowledgment to Dr. ABD AL RASOL JABAR ALZUBAIDY.

Who made the completion of this work possible in the first place by this advice and by the generous aid that he has offered to me. He has also been kind enough to follow me preparing the manuscript and to make constructive.
Abstract

Recently, digital data transmission has witnessed considerable importance. This is a result of huge increase in applications where data, voice, video, and multimedia are digitally processed in baseband modulation, however, the pulse wave form (mostly in PCM) is modified in such away as to suite transmission medium and thus often called digital line codes.

A general form of digital line codes are (NRZ-I, NRZ- L, NRZ-S) where explained in this research by using computer board system with electronic circuit design.

Finally describes the program software using C language and flow chart.
المستخلص

هذا البحث يقدم شرح مع تصميم دائرة الالكترونية رقمية تفعل بواسطة جهاز الحاسوب باستخدام برنامج كتب بلغة سي لغرض إتمام عملية التشفير الرقمي.

التشيفر الرقمي أنواع متعددة ولكن نوع يتم تفعيله برمجياً من خلال الحاسوب وتفعيل الدائرة الالكترونية الرقمية المتصلة بجهاز الحاسوب التي من خلالها يتم معرفة خصائص ومميزات كل نوع من أنواع التشفير الرقمي. مع استعراض بعض من الدوائر الالكترونية الرقمية التي عن طريقها تتم عملية التشفير الرقمي.

يمكن الاستفادة من هذا البحث كوسيلة إضافية للتشيفر الرقمي وطريقة المتغيرة ورؤية نتيجة كل عملية من عمليات التشفير الرقمي.
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## Abbreviation

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<td>AMI</td>
<td>alternate mark innovation</td>
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<td>Bi- phase- L</td>
<td>Bi- Phase Level</td>
</tr>
<tr>
<td>Bi- Phase – M</td>
<td>Bi – Phase mark</td>
</tr>
<tr>
<td>Bi – Phase – S</td>
<td>Bi– Phase Space</td>
</tr>
<tr>
<td>CMOS</td>
<td>Complimentary metaloxide silicon</td>
</tr>
<tr>
<td>DBi- Phase – M</td>
<td>Differential Bi- phase mark level</td>
</tr>
<tr>
<td>DBi- Phase – S</td>
<td>Differential Bi – Phase Space</td>
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<tr>
<td>DC</td>
<td>Direct current</td>
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<tr>
<td>I/O</td>
<td>input/ output</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronic Engineers</td>
</tr>
<tr>
<td>ISI</td>
<td>inter symbol interference</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network</td>
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<td>LPF</td>
<td>Low pass filter</td>
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<td>NRZ</td>
<td>Non- Return – to – zero</td>
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<td>NRZ- I</td>
<td>Non – Return – to – zero inverse</td>
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<td>NRZ – L</td>
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<td>NRZ- S</td>
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<td>RTZ</td>
<td>Return – to – zero</td>
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<td>PAM</td>
<td>Plus Amplitude modulation</td>
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<tr>
<td>PC</td>
<td>Personal computer</td>
</tr>
<tr>
<td>PCM</td>
<td>plus code modulation</td>
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<td>TCP</td>
<td>try to correct the data</td>
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<td>TS</td>
<td>Time period of each sample</td>
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<td>TTL</td>
<td>Transistor – transistor logic</td>
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Design of a Digital Encoding Circuit

A thesis submitted in a partial fulfillment of The requirements for the degree of MSc. In communication Engineering

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Chapter Two

Type of encoding
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Electronic circuit design
Chapter Four

Software code
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Conclusion & Recommendation
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