Telegraph

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Course Outline

- Course Name: Telecommunication Engineering
- Course Code: EEE-621
- Credits:3
- Hours/week:3

Overall Assessment

- **Marks Distribution**

Type	Marks
CT/ Home works/Presentation	20%
Attendance	10%
Final Exam	70%
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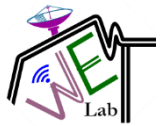
Overall	100%

Contents

- Introduction to Telegraphy
- Single and Double Current Telegraphy
- Teleprinters
- VFT and Carrier Telegraphy

Introduction

- **Definition:**
  - Telegraph (From Greek)
    - Tele- means “afar, far off”
    - Graphein-means writing
- A "**telegraph**" is a device for transmitting and receiving messages over long distances, i.e., for telegraphy.
- The word "telegraph" alone now generally refers to an electrical telegraph.
- **An electrical telegraph** is a telegraph that uses coded electrical signals to convey information via dedicated electrical wiring.
- **Wireless telegraphy** is transmission of messages over radio with telegraphic codes.



The Introduction of Telegraph

- The telegraph was invented by Samuel F.B Morse in 1837 in the New York University.
- It took him 12 long years.
- The telegraph was used for communication and transferring information faster and it was heavily used at wars, where they needed to send commands and request for help in emergency times.
- In addition it was also used in peoples social lives.
- Also the telegraph is used for sending messages, news and any urgent information.

Problem

- People Needed a faster way to communicate and send information and news

The Story Of The Telegraph

On October 1832, Samuel Morse and his family, sailed back home on a ship called the Sully.

One day during his trip, he heard some passengers talking about electricity.

He had an idea, he thought maybe electricity could transmit messages.

So for the rest of the trip, he worked on an alphabetical system that was then called the Morse code. The symbols he made up were the dot and the dash.

When he got back home he started making what he called a telegraph. It was made out of picture frames, lead, and wood from a table.

Morse Code

A •–	J •–––	S •••	1 •————
B –•••	K –•–	T –	2 ••———
C –•–•	L •–••	U ••–	3 •••——
D –••	M ––	V •••–	4 ••••—
E •	N –•	W •––	5 •••••
F ••–•	O –––	X –••–	6 –••••
G ––•	P •––•	Y –•––	7 ––•••
H ••••	Q ––•–	Z ––••	8 –––••
I ••	R •–•		9 ––––•
			0 –––––

Morse Code

- **Morse code** is a character encoding scheme used in telecommunication that encodes text characters as standardized sequences of two different signal durations called *dots* and *dashes* or *dits* and *dahs*.
- Morse code is named for Samuel F. B. Morse, an inventor of the telegraph.
- The International Morse Code encodes the 26 English letters A through Z, some non-English letters, the Arabic numerals and a small set of punctuation and procedural signals (prosigns).
- There is no distinction between upper and lower case letters.

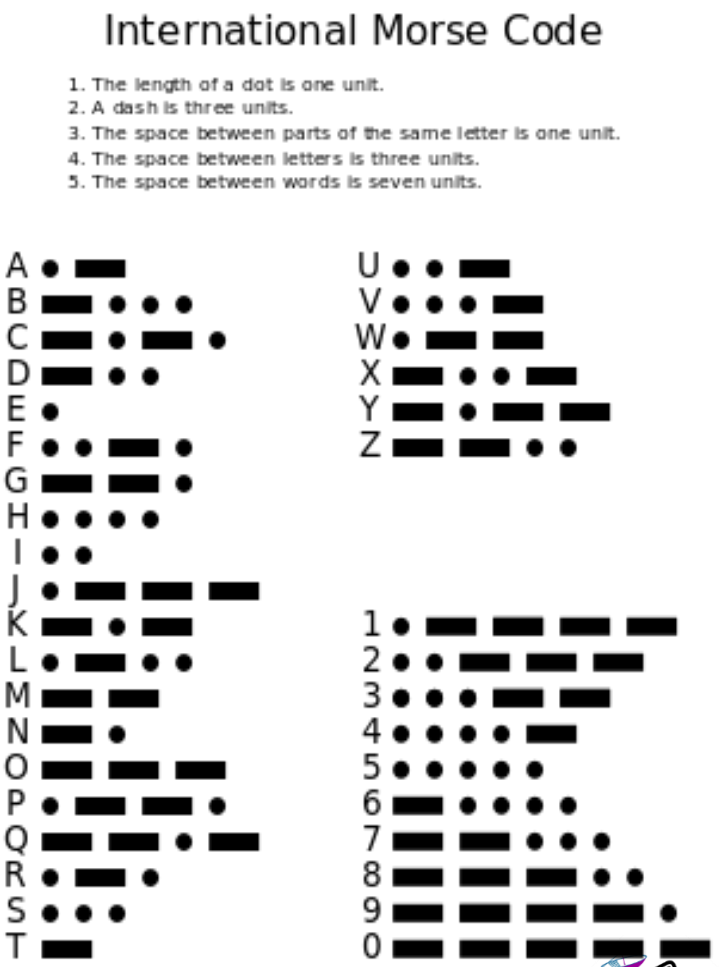


Chart of the Morse code 26 letters and 10 numerals.

Morse Code

- Each Morse code symbol is formed by a sequence of dots and dashes.
- The dot duration is the basic unit of time measurement in Morse code transmission.
- The duration of a dash is three times the duration of a dot. Each dot or dash within a character is followed by period of signal absence, called a *space*, equal to the dot duration.
- The letters of a word are separated by a space of duration equal to three dots, and the words are separated by a space equal to seven dots.
- To increase the efficiency of encoding, Morse code was designed so that the length of each symbol is approximately inverse to the frequency of occurrence in text of the English language character that it represents

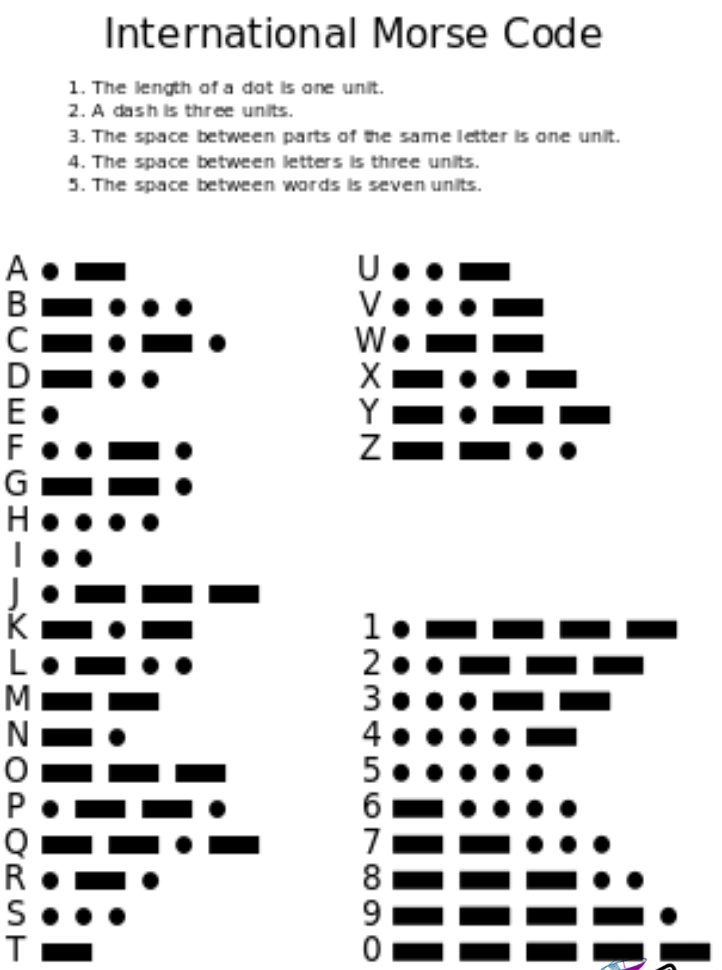


Chart of the Morse code 26 letters and 10 numerals.

Morse Code

- Morse code is usually transmitted by **on-off keying** of an information carrying medium such as electric current, radio waves, visible light or sound waves.
- The current or wave is present during time period of the dot or dash and absent during the time between dots and dashes.

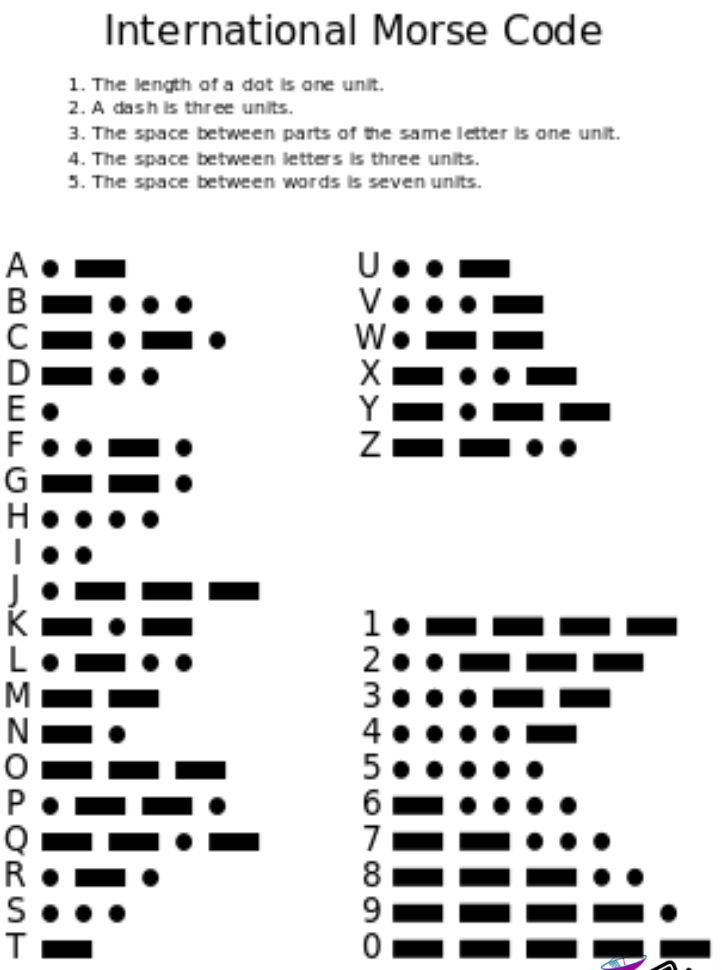


Chart of the Morse code 26 letters and 10 numerals.

How The Telegraph Works

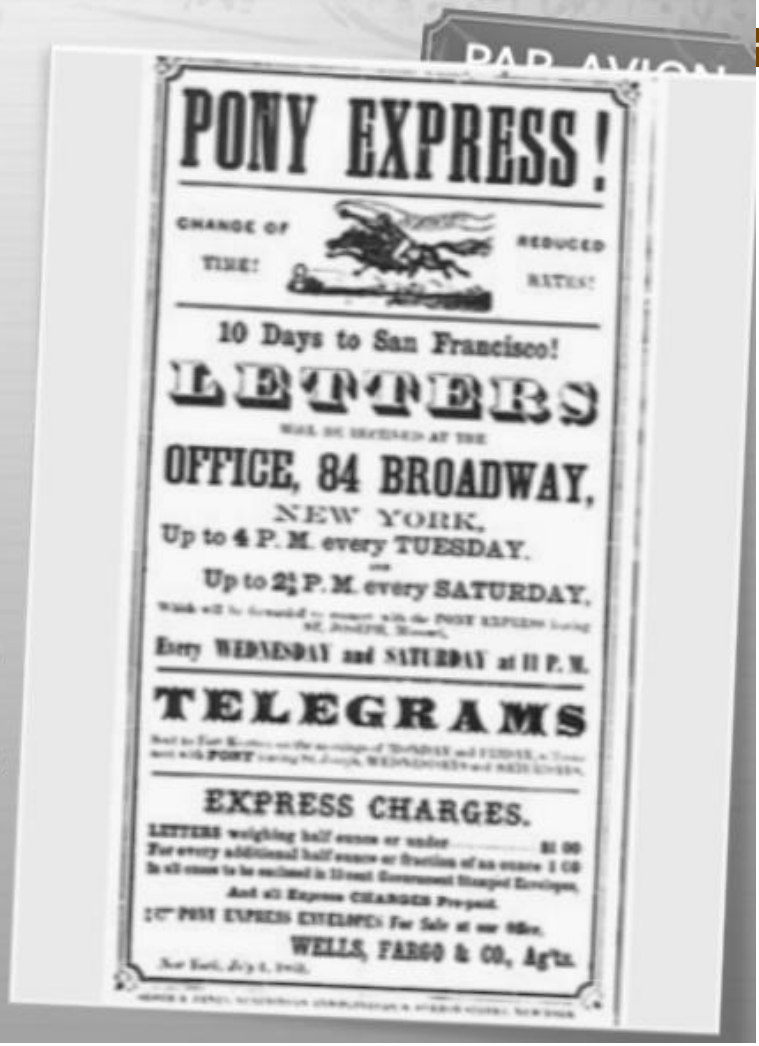
The telegraph works by electrical pluses which transfer coded messages through a wire to the other end, where then the massage is decoded into words.

How The Telegraph Solves The Problem

The invention of the telegraph solved the problem by sending messages and information much faster.

What Humans Did About The Problem Before The Telegraph

Before the telegraph was invented messages would take months or even years to reach. The Pony Express was a mail company way back in the 1860s. It was created to deliver the mail faster. But it still took long.



How The Telegraph Improved Human Life

The Telegraph improved the way people communicate, and they could send messages quicker between cities and even continents.

The Telegraph spread important news, useful information and emergency warnings faster. Knowing this information people can react faster.

Detail Changes Or Improvements Made To The Telegraph Through Time

- In 1580 operators realized that the clicks of the recording instrument made a sound pattern. This allowed the operator to hear the messages and write it down. The telegraph became a more speedy system.
- In 1871 the duplex telegraphy was invented. Two messages were sent over the wire, one in each direction.
- In 1883 an English automatic telegraph was invented. It allowed larger numbers of words to be transmitted over a wire at once.
- Buckingham's Machine Telegraph printed received messages in Roman letters on a paper.
- In 1890 the Vibroplex was invented. It has a automatic key called the bug key which made the dots automatically.

The Duplex Telegraph

How Has The Telegraph Created New Problems For Us

- *People needed to build telegraph stations and trained many operators.*
- *People needed to lay cable wires between many cities, even continents.*
- *Nowadays the telegraph doesn't make any problems fo us. It had been replaced by t radio, the newspapers, television and the internet. The television and the intern might have bad influence on people. We need to be aware on what based our decisions, beliefs and values.*

Timeline Of The History Of The Telegraph

- In 1794 Claude Chappe invented the non-electric telegraph.
- In 1809 Samuel Soemmering invented a telegraph that used electrodes in water.
- In 1828 Harrison Dyar invented telegraph that sent electrical sparks through chemically treated paper tape.
- In 1825 William Sturgeon invented the electromagnet.
- In 1830 Josef Henry used the electromagnet to send the signal.
- In 1837 William Cooke and Charles Wheatstone made the telegraph based on electromagnetism.
- In 1837 Samuel Morse successfully used the electromagnet and invented a telegraph system that had practical success.
- The telephone (1849) and the radio (1897) were the new inventions that replaced the telegraph.

Teleprinter

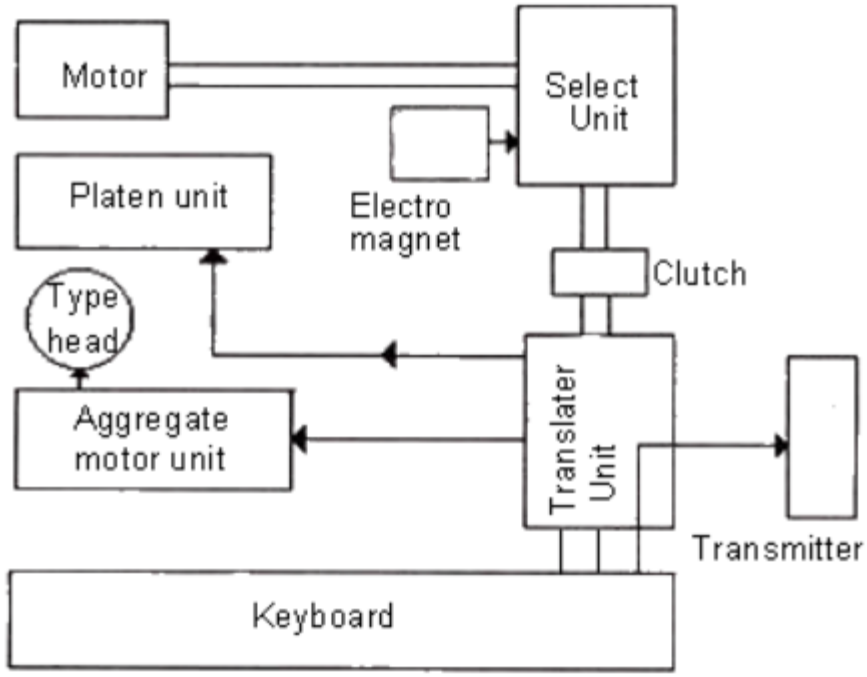
A teleprinter (teletypewriter, Teletype or TTY) is a electromechanical typewriter that can be used to communicate typed messages from point to point and point to multipoint over a variety of communication channels that range from a simple electrical connection, such as a pair of wires, to the use of radio and microwave as the transmission medium. They could also serve as a command line interface to early mainframe computers and minicomputers, sending typed data to the computer with or without printed output, and printing the response from the computer.

The salient features of teleprinter are listed below:

1. A teleprinter is a telegraph transmitting receiving machine.
2. Teleprinter resembles a typewriter because it has a typewriter like keyboard.
3. A teleprinter is a mechanical device driven by electrical motors, recently Electronic machine has been introduced, controlled by the microprocessor.
4. Code used by teleprinter machine is the 5-unit code,
5. A teleprinter works on the start-stop principle.
6. A teleprinter acts both as a transmitter and as a receiver.
7. When used as a receiver, the signals are received in the serial form are converted into Parallel. Then a detector converts it into the character and the printer prints it on the paper.
8. Every teleprinter has also the facility of local record,
9. The actual mechanical arrangement of a teleprinter machine is very Complicated, but a block diagram is shown in the figure. Which shows the different parts of the machine.

Application of the Teleprinter

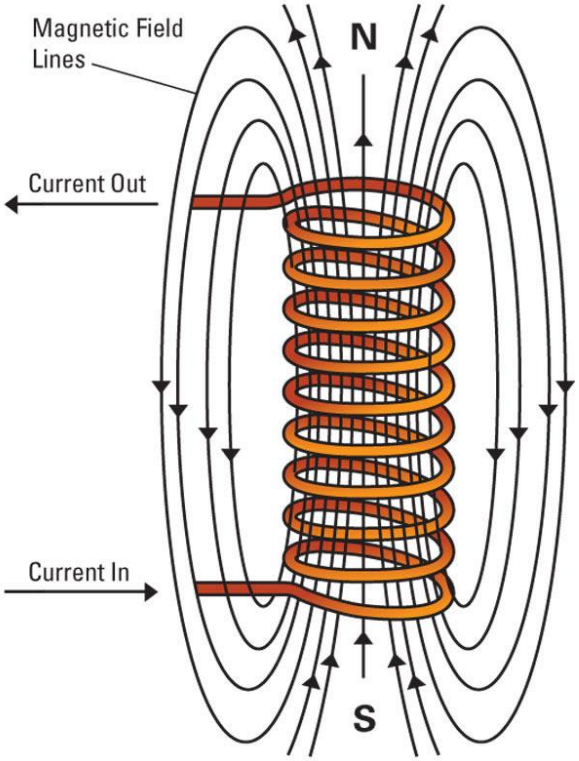
1. The teleprinter is basically used for sending and receiving of Telegraph signals,
2. Teleprinter switching system is used in Telex (teleprinter exchange) which is a convenient method of sending printed messages. An auto- telex service has the advantage of communication as in telephone astern and transfer of written record as in telegraph system.
3. Due to these two advantages, these services are used both for commercial and industrial purposes,
4. The teleprinter can also be used for typing the local records.



Teleprinter Block Diagram

Electromagnets

- An electromagnet is a type of magnet in which the magnetic field is produced by an electric current.
- Electromagnets usually consist of wire wound into a coil.
- A current through the wire creates a magnetic field which is concentrated in the hole, denoting the center of the coil.



References

- https://slideplayer.com/slide/5735885/