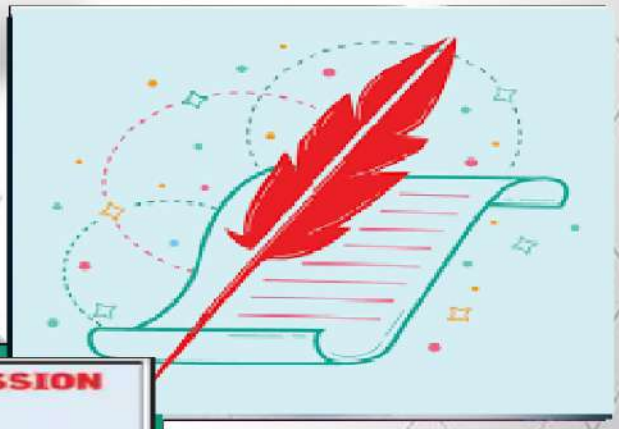
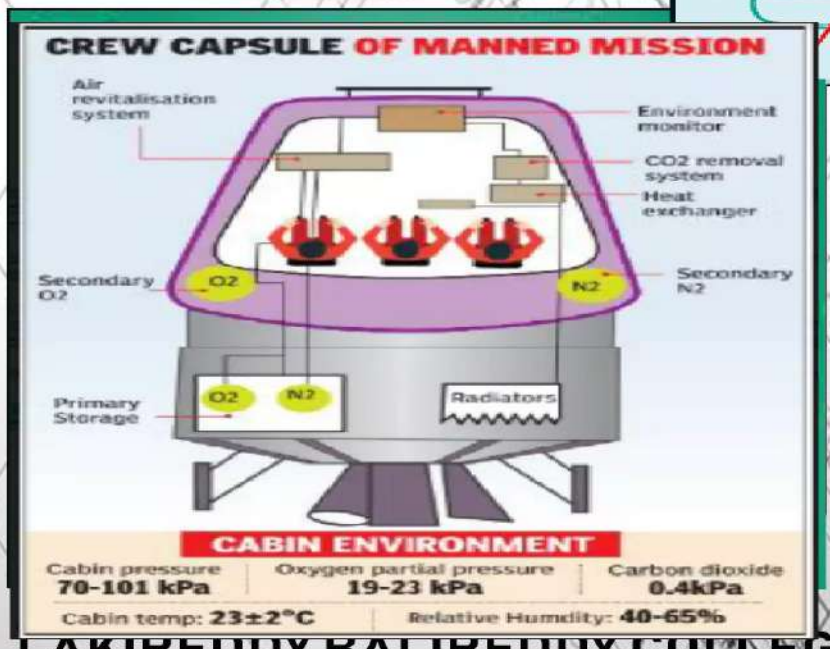
ELECTRONICS & COMMUNICATION ENGINEERING

TECH CONNECT

June,2021





LAKIREDDY BALIREDDY COLLEGE OF ENGINEERING
MYLAVARAM

Contents

1. Voice disorders

Humans use voice as a primordial natural technique for communication. We used to rely on voice communication in both our personal and professional lives. The production of voice is the consequence of a complicated mechanism involving several respiratory organs. The sound produced by the vibrating of the vocal folds of the larynx is also known as the voice box, is referred to as voice. The throat and mouth modify this sound is known as the larynx fundamental tone, to form speech. The following are some of the characteristics of voice: 1. Pitch refers to how high or low a person's voice is. Pitch is also known as intonation, can change throughout speech to convey meaning or emotion. 2. Loudness refers to the volume of a voice. Loudness can change during a speech to convey emphasis and emotion. 3. Voice quality refers to how clear a person's voice is. A strained, harsh, breathy, and scratchy voice is a sign of a disordered voice. 4. Resonance refers to the Voice modulation as it travels through the throat, mouth, and nose.

In recent years, a change in lifestyle has been linked to an increased incidence of pathological voice disorders. Around a quarter of the population works in jobs that are vocally demanding. For these people, either their occupations involve a lot of talking or their work settings cause them to talk over a lot of noise. Teachers, attorneys, auctioneers, aerobics instructors, singers, actors and manufacturing supervisors are among the professions with high vocal demands. As a result, working on digital speech signal processing has been discovered to provide a noninvasive analytical methodology that is considered an effective assisting tool for medical professionals when recognizing voice abnormalities in their early stages. Voice diseases impact the vocal folds, causing irregular vibrations as a result of various causes that contribute to voice vibrations malfunctioning. Due to their partial closure, vocal fold diseases cause changes in the vibratory cycle of the vocal folds.

Voice diseases also change the structure of the vocal tract and cause spectral abnormalities. The vibration of the vocal folds is affected by a variety of elements, including mucus on the tissue, stiffness, tension, muscles in the larynx, fold closure and opening, and so on. Different vocal disorders affect these parameters in different ways. Because of the location and extent of the diseases, the vocal folds close in different ways during vibration. As a result, the vibration differs depending on the type of pathology. This vibration causes glottal source excitation frequencies, as well

as affecting the supraglottis region, which impacts the output voice signal frequency. The voice muscles in the larynx, or voice box, are affected by spasmodic dysphonia, a neurological condition. When we speak, air from our lungs is forced through two elastic structures called vocal folds or vocal cords, causing them to vibrate and produce speech (see figure). The muscles inside the vocal folds endure sudden involuntary movements termed spasms, which interfere with the folds' capacity to vibrate and create voice in spasmodic dysphonia.

Dysphonia Disease:

Voice breaks and a tight, strained quality are common symptoms of spasmodic dysphonia. People with spasmodic dysphonia may experience voice breaks every few sentences. However, in most cases, the disease is more severe, and spasms may occur every other word, making it impossible for others to understand a person's speech. Symptoms may appear moderate at first and only occur on rare occasions, but they may intensify and become more frequent over time. Spasmodic dysphonia is a long-term condition that affects a person's voice. Anyone can be affected by spasmodic dysphonia. It's a rare condition that affects one to four people out of every 100,000 people. People between the ages of 30 and 50 are most likely to experience the initial signs of spasmodic dysphonia. It has a greater impact on women than on men.

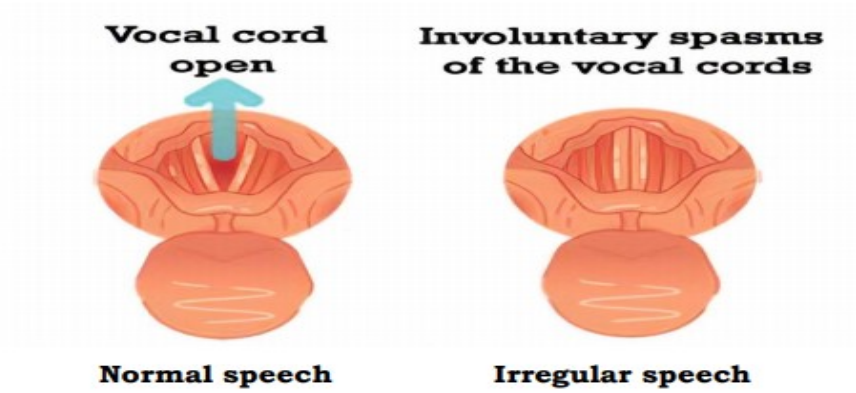


Fig.1.Opeing of Vocal cords during regular and irregular speech

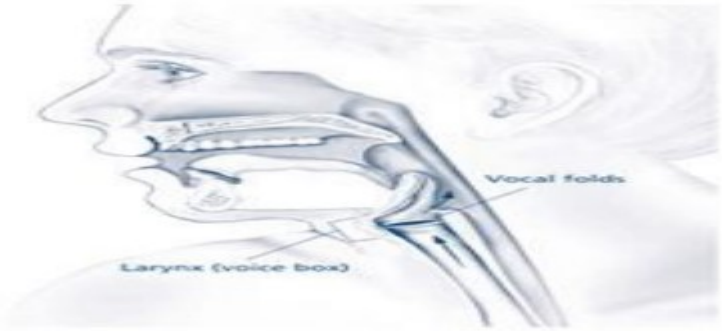


Fig.2.Parts of throat involved in dysphonia

Laryngitis Disease:

The vocal cords are housed in the larynx, often known as the voice box. Breathing, swallowing, and talking are all dependent on them. The vocal cords are two tiny mucous membrane folds that cover cartilage and muscle and vibrate to make sound. Laryngitis is a condition in which the larynx swells and becomes inflamed. It might be acute or chronic, although most of the time it is only temporary and has no major implications.

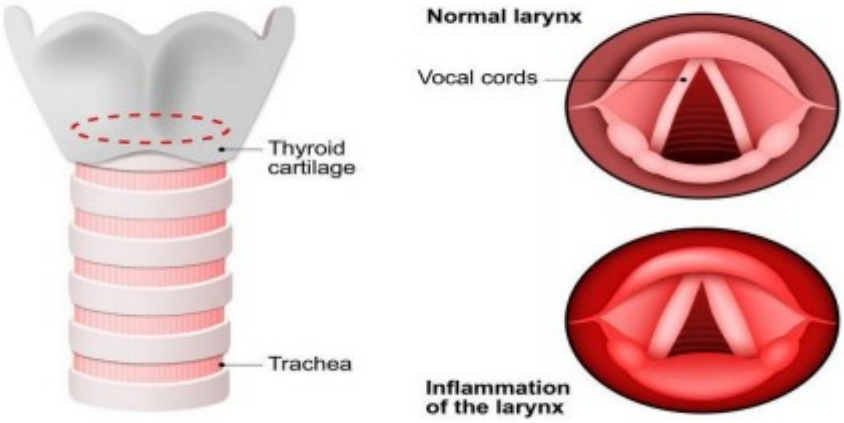


Fig 3.Swelling of Larynx

Voice disorders such as dysphonia have become far more common, with an estimated 7.5 million people in the United States alone suffering due to vocal issues. In Saudi Arabia, however, voice abnormalities affect about 15% of all patients who visit King Abdul Aziz University Hospital in Riyadh. Teaching professions are more affected by voice difficulties than other professionals. According to various research conducted in the United States, voice issues affect 57.7% of teachers and 28.8% of non-teachers during the course of their lives. Furthermore, roughly 33% of male and female instructors in the Riyadh area of Saudi Arabia suffer from voice issues at some time in

their careers.

The Communication and Swallowing Disorders Unit at King Abdul Aziz University Hospital examined a variety of cases and discovered roughly 760 instances every year in people with various vocational and etiological backgrounds. The use of noninvasive approaches to detect or identify pathological abnormalities in speech has grown over time, and several studies involving automatic detection and classification of vocal fold diseases have been conducted in the previous decade. However, due to a lack of standard methods and equipment for vocal abnormalities, they must be investigated. The discovery of pathology is the first and most important step in appropriately diagnosing and controlling a vocal issue. Objective evaluation, such as acoustic analysis, is not dependent on human intervention and can help professionals make decisions. We are convinced that physicians make the final choice on medical diagnoses, and that objective assessments can only serve as a supplement. The subjective evaluation of voice quality, on the other hand, is based on personal experience and can differ from one person to the next. The goal of pathological voice identification is to distinguish between normal and abnormal voices.

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2. Internet of Things

The Internet of Things (IoT) helps to connect physical things to the internet, allowing them to collect and share data. The availability of low-cost resources like microcontrollers and on-chip computers can help in this. These resources are formed by combining various sensors, peripherals, and other components, together with on chip computers and microcontrollers. It helps to send or control data to obtain real-time information.

The data acquired in real-time by these physical devices is communicated to a personal computer or a mobile application employing this technology to operate and perform certain operations. The reasons for combining the Internet of Things with devices for custom usage are listed below:

- The physical gadgets are equipped with a number of sensors that are used to collect data. With a continual flow of data, one may evaluate data trends and improve the personalized device's operation and capabilities.
- The status and statistics of devices that use IoT technology can be viewed remotely from any place.
- These devices are capable of doing jobs fast and accurately, saving time and money. These are created in such a way that they require little or no human intervention.
- The Internet of Things (IoT) is one of the fastest-growing and most rapidly-changing technologies. It is very simple and quick to make any necessary changes to the device otherwise, it would be difficult to adapt the hardware circuitry to meet our requirements, which would be costly and time consuming.
- With its high computing capacity, resources, availability, scalability, and interoperability, IOT has revolutionized numerous industries, including business, health care, and many others.

Fig 1. Internet of Things

However, there are still important advancements in IOT that need to be made before it can be used in the real world. The following are some of the factors that support the above mentioned assertion:

- Although it appears that IoT devices do tasks quickly, they actually require a lot of complicated processes and backend computations. Any minor error made during the operation will have an impact on the entire process.
- IoT is completely reliant on an internet connection if the internet is unavailable, it cannot be used in any form. Data is abundant, yet it is exposed to the outside world.
- Identifying theft is becoming more common among those who utilize IoT devices in their daily lives. Data breaches are also seen as a higher concern by businesses, leading to cyber-attacks and data misuse.

Before the introduction of Internet of Things (IoT), the involvement of manpower is more in order to provide security to the home. Even though with the right involvement of manpower, it is difficult to identify the unusual events like fire accidents, gas leakage, motion or any intruder detection. The Internet of Things is a technology in which all devices communicate with each other through internet. This technology can be used in our home security systems in an effective manner. Many existing systems failed to achieve some challenging issues like multi-sensing operations, delay in alerts and non-continuous monitoring due to power breakdowns.

~Nadella Vinod Kumar(17761A0437)

~ Mitta Suresh(17761A0433)

3. Hope...

When all about you is black with gloom,
And all you feel is pending doom.
When your bones are racked with grime despair,
When every breath is gasp for air.
Keep on going, though you need to grape,
For around the bend is a ray of hope.
A rope of hopes perhaps all that's left,
As your will to live has been bereft.
You've lost it all, it's just no use!
You can end it all, you need no excuse.
But throw away that piece of rope,
And give yourself a chance of hope.

Just give yourself another day,
Brushing aside what your thoughts may say.
This is your life and you can make a new start,
By ignoring the brain-just follow the heart.
Taking baby steps in order to cope,
And minute by minute you'll build on your hope.
Build on your hope., one day at time,
Though the road be steep and hard to climb.
The hurts of the past-they should be dead.
The fears of the future are all in your head.
Just live in the present and refuse to mope
Your life will sparkle for you're living in hope.

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--Kancharla Mahija Cherry Blossom(19761A0483)

4. Optical Fibre: The New Era of High-Speed Communication

Introduction

Fiber-optic communication is a method of transmitting information from one place to another by sending pulses of light through an optical fiber. The light forms an electromagnetic carrier wave that is modulated to carry information. First developed fiber-optic communication systems have revolutionized the telecommunications industry and have played a major role in the advent of the Information Age. Because of its advantages over electrical transmission, optical fibers have largely replaced copper wire communications in core networks in the developed world. The process of communicating using fiber-optics involves the following basic steps: Creating the optical signal involving the use of a transmitter, relaying the signal along the fiber, ensuring that the signal does not become too distorted or weak, receiving the optical signal, and converting it into an electrical signal.

Basic Optical Fiber Communication System:

The basic components in the optical fiber communication system are shown in fig. The input electrical signal modulates the intensity of light from the optical source. The optical carrier can be modulated internally or externally using an electro-optic modulator (or) acousto-optic modulator. Nowadays electro-optic modulators are widely used as external modulators which modulate the light by changing its refractive index through the given input electrical signal. In the digital optical fiber communication system, the input electrical signal is in the form of coded digital pulses from the encoder and these electric pulses modulate the intensity of the light from the laser diode or LED and convert them into optical pulses. In the receiver stage, the photo detector like avalanche photodiode (APD) or positive-intrinsic negative (PIN) diode converts the optical pulses into electrical pulses. A decoder converts the electrical pulses into the original electric signal.

Modern fiber-optic communication systems generally include an optical transmitter to convert an electrical signal into an optical signal to send into the optical fiber, a cable containing bundles of multiple optical fibers that is routed through underground conduits and buildings, multiple kinds of amplifiers, and an optical receiver to recover the signal as an electrical signal. The information transmitted is typically digital information generated by computers, telephone systems, and cable television companies.

Comparison with Electrical Transmission:

The choice between optical fiber and electrical (or copper) transmission for a particular system is made based on a number of trades-offs. Optical fiber is generally chosen for systems requiring higher bandwidth or spanning longer distances than electrical cabling can accommodate. The main benefits of fiber are its exceptionally low loss (allowing long distances between amplifiers/repeaters), its absence of ground currents and other parasite signal and power issues common to long parallel electric conductor runs (due to its reliance on light rather than electricity for transmission, and the dielectric nature of fiber optic), and its inherently high data-carrying capacity. Thousands of electrical links would be required to replace a single high bandwidth fiber cable. Another benefit of fibers is that even when run alongside each other for long distances, fiber cables experience effectively no crosstalk, in contrast to some types of electrical transmission lines. Fiber can be installed in areas with high electromagnetic interference (EMI), such as alongside utility lines, power lines, and railroad tracks. Optical fibers are more difficult and expensive to splice than electrical conductors. And at higher powers, optical fibers are susceptible to fiber fuse, resulting in catastrophic destruction of the fiber core and damage to transmission components. Nonmetallic all-dielectric cables are also ideal for areas of high lightning-strike incidence. In short distance and relatively low bandwidth applications, electrical transmission is often preferred because of its:

- Lower material cost, where large quantities are not required.
- Lower cost of transmitters and receivers.
- Capability to carry electrical power as well as signals (in specially designed cables).
- Ease of operating transducers in linear mode.

Because of these benefits of electrical transmission, optical communication is not common in short box-to-box, backplane, or chip-to-chip applications.

Advantages of Optical Fiber Communication:

i. Wider bandwidth

The information carrying capacity of a transmission system is directly proportional to the carrier frequency of the transmitted signals. The optical carrier frequency is in the range 1013 to 1015 Hz while the radio wave frequency is about 106 Hz and the microwave frequency is about 1010 Hz. Thus, the optical fiber yields greater transmission bandwidth than the conventional communication systems and the data rate or number of bits per second is increased to a greater extent in the optical fiber communication system. Further the

wavelength division multiplexing operation by the data rate or information carrying capacity of optical fibers is enhanced to many orders of magnitude.

ii. Low transmission loss

Due to the usage of the ultra-low loss fibers and the erbium doped silica fibers as optical amplifiers, one can achieve almost lossless transmission. In the modern optical fiber telecommunication systems, the fibers having a transmission loss of 0.002 dB/km are used. Further, using erbium doped silica fibers over a short length in the transmission path at selective points; appropriate optical amplification can be achieved. Thus, the repeater spacing is more than 100 km. Since the amplification is done in the optical domain itself, the distortion produced during the strengthening of the signal is almost negligible.

iii. Dielectric waveguide

Optical fibers are made from silica which is an electrical insulator. Therefore, they do not pick up any electromagnetic wave or any high current lightning. It is also suitable in explosive environments. Further the optical fibers are not affected by any interference originating from power cables, railway power lines and radio waves. There is no cross talk between the fibers even though there are so many fibers in a cable because of the absence of optical interference between the fibers.

iv. Signal security

The transmitted signal through the fibers does not radiate. Further the signal cannot be tapped from a fiber in an easy manner. Therefore, optical fiber communication provides hundred per cent signal security.

v. Small size and weight

Fiber optic cables are developed with small radii, and they are flexible, compact and lightweight. The fiber cables can be bent or twisted without damage. Further, the optical fiber cables are superior to the copper cables in terms of storage, handling, installation and transportation, maintaining comparable strength and durability.

Optical Fiber Limitations:

- Optical Fibre cables have limited bend radius (about 30 mm). So, if they are bent more, it might lead to some signal loss. But recently, bend resistant fibres have been introduced which have higher tolerance to bending.
- Unlike Copper UTP cables which have standard Rj-45 Jacks and connectors (mostly), optical fibre cables have many types of connectors and this lack of standardization adds confusion.

- By bending the normal optical fibre cables, some leakage of signal could be induced and that can be used for hacking the information in them. So, even though doing that might be difficult, they are not totally tamper proof.
- Single mode cables and their associated optics (active components) are very expensive. Even though multi-mode cables/ optics are less expensive, they are not even close to the costs of copper UTP cables/ ports. Moreover, multi-mode cables have restrictions in distance for supporting higher bandwidth (like 1 Gbps and 10 Gbps).
- There are outdoor fibre cables but they need to be shielded well. This shielding makes them less agile/ flexible to run in all the places and it increases the cost of cables as well.
- Fibre cables cannot be directly terminated on to the network/ optical switches. They need a whole array of active/ passive components like SFP Modules, Fiber Patch Cords, and appropriate connectors and Couplers. All these components add the cost of fibre network implementation at each location.

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~ Shaik Bademiya(18761A04H0)

5. Nature

~Jasmitha(1976104D5)

6. Feeding and Radiation Techniques for antennas

Micro strip antenna can fee d by variety of methods. Those methods are of two categories-contacting and non-contacting schemes. There are four type s of feeding techniques are available . They are

1. Micro strip line
2. Co-axial feed
3. Aperture coupling
4. Proximity coupling

Micro strip line:

In this feeding technique, a conducting strip is directly connected to the edge of the patch as show n in Fig.1. This type of feed also called Offset Micro strip printing operation (contacting scheme). The advantage is that the feed can be etched on the same substrate to provide a planar structure. It provides ease of fabrication, impedance matching

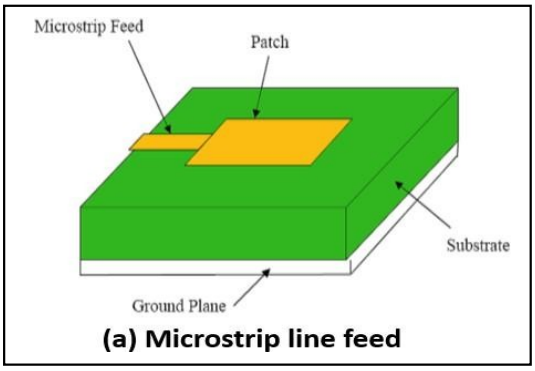

Fig. 1 Micro strip line feed

Co-axial feed:

The most widely recognized taking care of method utilized for micro strip radio wires is Co-hub feed (or test feed)]. An inward channel of co-hub connector stretches out through the dielectric substrate and is fastened or joined to the transmitting patch and the external conduit is associated with the ground plane as displayed in Fig.2. The upside of test feed is that the feed can be put at any ideal situation to give impedance coordinating.

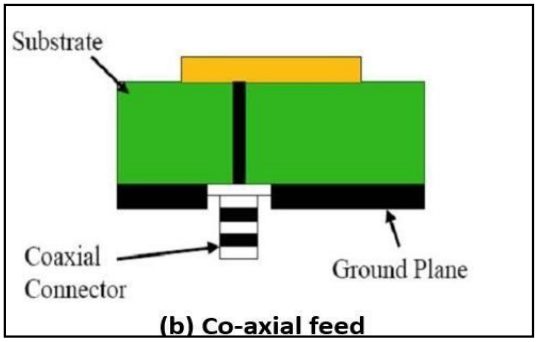

Fig 2. Co-axial feed

Aperture coupling:

Gap couple d fee d is an aberrant technique for taking care of the fix (non-reaching plan) displayed in Fig.3. It couples the fix radio wire with micro strip line through an opening and makes an electric documented in the gap which incites surface flows on the fix . The detriment of this procedure is that hard to create due to having various layers, likewise builds the thickness of the receiving wire.

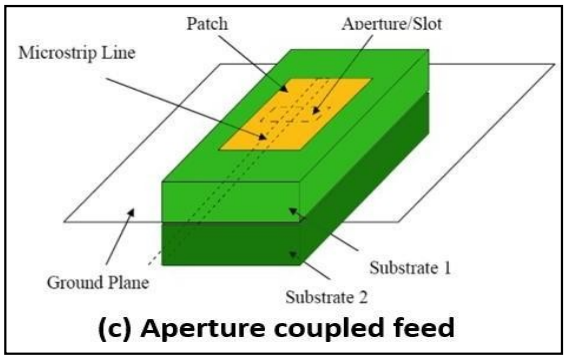

Fig. 3. Aperture couple d feed

Proximity coupling:

This taking care of strategy additionally called as electro-attractive coupling plan. In this taking care of, two substrate materials are utilized so the feed line is given in the middle of those two substrates and the fix is on top of the upper substrate material displayed in Fig.4. Here, additionally the thickness of receiving wire increments.

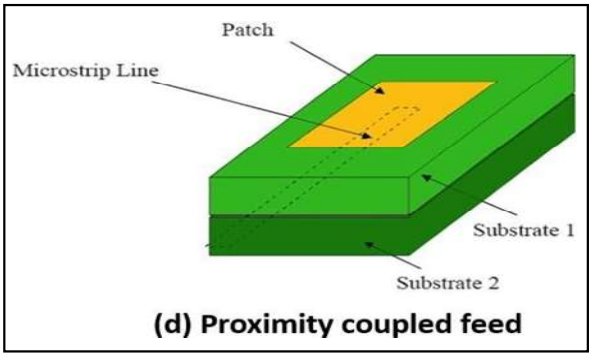

Fig. 4. Proximity coupled feed

Radiation mechanism:

The main purpose of an antenna is power radiation or reception. The Antenna can be attached to the circuitry at the station through a transmission line. The performance of an antenna depends upon the radiation mechanism of a transmission line. The radiation from an antenna occurs when the Electromagnetic field is generated by a source is transferred to an antenna equipment through the Trans mission line and separated from the Antenna into free space.

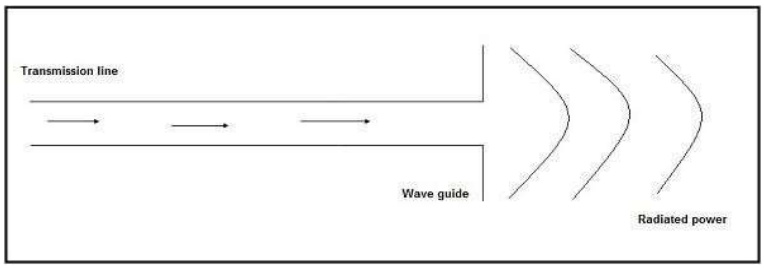

Fig.5 Radiation mechanism

Radiating mechanism is of two types

1. Single wire
2. Two wire

1. Single-wire :Radiation in a receiving wire happens if the wire is bended, spasmodic, bowed and ended and when the charge is wave ring in time - space, it transmits even the wire is straight.

Distinctive wire setups for single wire d receiving wire radiation are

(i) Curved wire: Helical radio wire and circle receiving wires goes under this class these sorts of radio wires are utilized for high recurrence versatile handsets

which w e are utilized.

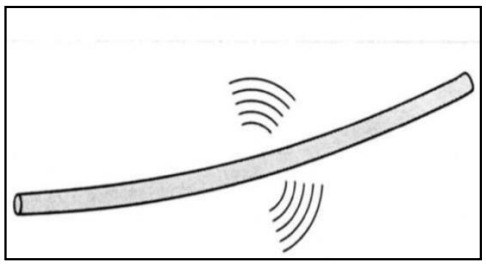

Fig.6. Curve d wire

(ii)Bent wire : The radiation happens all the more productively when the wire is bowed, it is possible that it very well might be single end or at both the finishes of the wire on the grounds that the progression of sent energy attempts to escape from the transmission line.

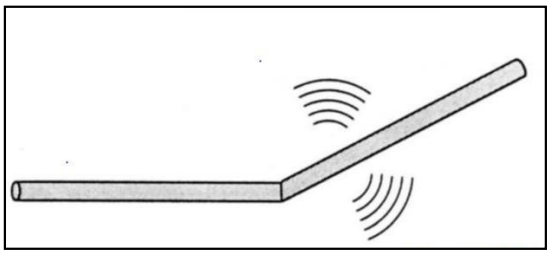

Fig 7. Bent wire

(iii) Discontinuous wire : The progression of trans mission of energy is exceptionally high when the wave is communicating starting with one limit then onto the next, this irregularity in the medium is called as spasmodic w ire.

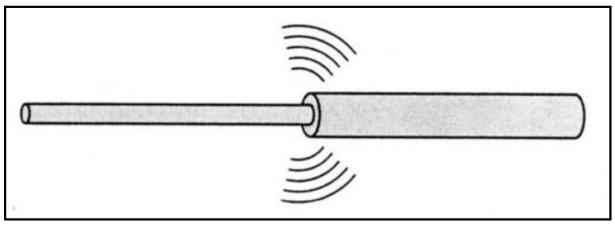

Fig.8. Discontinuous wire

2.Two-wire: Allow us to accept that a voltage source is associated with a two - conductor transmission line which is associated with a radio wire.

3. By presenting the voltage across the two-transmitter line transmission creates a solid electric documented between the conduits. Both direct and half dipole goes under this two-wire radiation system

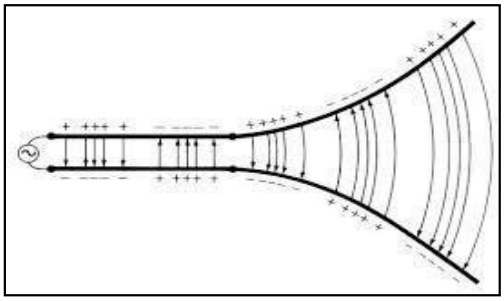

Fig.9. Two-wire Trans mission line

~Madu Mounika(17761a04e9)
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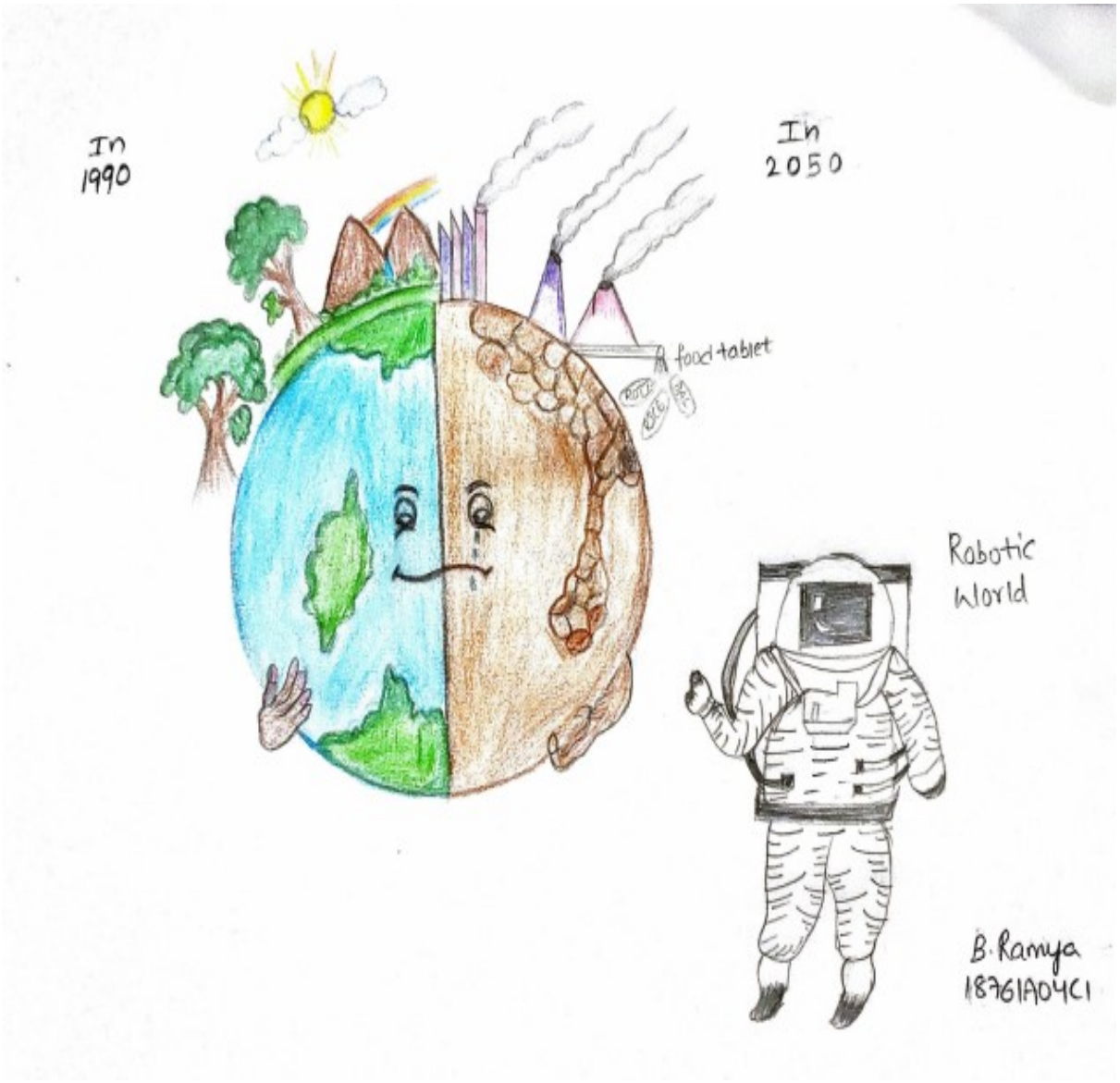
7. World: Past and Future



Editorial

Students are always creative and energetic and sky is the bound for that. If they are interested they can do miracles either as an individual or as a group. A new series of the magazine is getting started from this issue onwards. To encourage the students who are multi talented, literary articles will also be included in the magazine now onwards. Poetries, paintings, motivational stories are welcomed from either faculty or the students. For getting success these days having sound technical knowledge is not mere sufficient. One should have good presentation skills. Hope this new dimension of the magazine will be welcomed by all.

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