



# ELECTRA-THE VOICE OF ELECTRICALS

VOLUME 1, ISSUE 2

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**PUBLISHED BY:**

**LEAGUE OF ELECTRICAL ENGINEERING STUDENTS**

**DEPARTMENT OF ELECTRICAL ENGINEERING  
INSTITUTE OF DIPLOMA STUDIES**

**NIRMA UNIVERSITY**

**SARKHEJ GANDHINAGAR HIGHWAY, AHMEDABAD**

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## MEMORIES OF THE SPECIAL EVENTS



"One Day Seminar On Improve Your Soldering Skills "



Remebering the Almighty With HOD and Faculty Advisor of LEES.



An Interactive Session of 07 Electrical B on Soldering Workshop



From Left Mr. Amey Upadhye and Right Mr. Bhavin Kansara on Occasion of Soldering Workshop.



## About The Association

The department had established League of Electrical Engineering Students on 18<sup>th</sup> August 2004. It has been established for the welfare and development of the students of Electrical Engineering Department. The association is aiming to provide a common platform for exchange of ideas and disseminating knowledge in technical as well as non technical area for satisfying the mission of producing a complete engineer and worth citizen.

## Objectives of LEES

1. To establish and maintain contact among the present and a faculty of Electrical Engineering. To Pursue and Sustain excellence and technical as well non technical skills by interaction between student and faculty.
2. To encourage and assist the students of electrical engineering in various academic and cultural activities.
3. To Generate fund through fees for conducting activities for achieving the objectives of the society.
4. To Project constructive activities of Institute of Diploma Studies.

## Faculty Advisor LEES

Prof. Hemang Pandya (I/C HOD, EE, IDS, NU)

Prof. Dhiren Rathod (Asst. Professor EE, IDS, NU)

## From The Editor Desk

It Gives Us An Immense Pleasure To Introduce **"ELECTRA"- THE VOICE OF ELECTRICALS.** A NEWS LATER By Electrical Students And For The Study Of Community. It Gives Opportunity To The Electrical Engineering Students To Bring The In-Depth Knowledge, Principle And Technology Together And Share With All. "LEES" Also Welcomes 2010 Batch From This Issue. We Welcome Your Suggestions And Opinions. We Solicit Your Active Participation And Support For Betterment Of Every Next Issue.

## Editorial Board

Prof. Miral Shah (Asst. Professor in EE, IDS, NU)

Mr. Akash Tanna (07DEE034)

Mr. Amey Upadhye (07DEE017)

Mr. Bhavin Kansara (07DEE014)

Mr. Hardik Thaker (08DEE024)





## DEPARTMENTAL ACTIVITIES

Activity	Date/Duration
"LEES" Essay writing competition in coordination with ramchandra mission:Topic was "Self respect and self confidence can shape one's character "	4 <sup>th</sup> , 5 <sup>th</sup> and 6 <sup>th</sup> September,2008
"LEES" Essay writing competition. Topic was "Global warming and its effect on developing countries"	6 <sup>th</sup> September,2008
"LEES" Quiz-IQ test	3 <sup>rd</sup> July,2008
"LEES recreation activity" (counter strike game)	18 <sup>th</sup> October,2008
"LEES one minute competition"	13 <sup>th</sup> February,2009
"LEES painting competition"	1 <sup>st</sup> April ,2009
"Annual General Meeting Of LEES"	10 <sup>th</sup> August, 2009
"LEES recreation activity" (Movie- The Apollo – 13)	10 <sup>th</sup> August, 2009
" Technical Chart Competition on Celebration of Foundation Day"	14 <sup>th</sup> September,2009
"Technical Paper Presentation"	06 <sup>th</sup> September, 2010
"Annual General Meeting Of LEES"	06 <sup>th</sup> September, 2010
"LEES recreation activity" (Movie- The day the Earth Stood Still)	06 <sup>th</sup> September, 2010
"LEES" Group Discussion on Celebration of Foundation Day	14 <sup>th</sup> September, 2010
"LEES" Gujarati Elocution Competition as a part of Celebration of SWARNIM GUJARAT	27 <sup>th</sup> September, 2010

## Expert Lectures

1. An Expert Lecture on Personality Development and Leadership Qualities by Mr. Chinma Yagnik,( Director of Megnalaze).
2. An Expert Lecture on Entrepreneurship development and fundamentals of transformers and rectifying circuits' by Mr. V.G.Patel( Head of Training depart of Transformer And Rectifier)
3. An Expert Lecture on the Manage-mental Skills and Fundamentals of BANKING Mr.D Trivedi.(Retired Manager of Bank of Baroda)
4. An Expert Lecture on Fundamentals of Electrical Machine Mr. M.M.Shah (Ex-HOD DEE)

### Placement Allotted To The Students Passed In Year 2010 By Following Company With Basic Salary.

Sr. No.	Organization	City	Total Numbers of Students allotted
1	Transformers & Rectifiers Limited	Ahmedabad	5
2	L & T Limited [ ECC Division]	Vadodara	3
3	Essar Group	Surat	5
4	Tata Motors Limited	Mumbai	5
5	Tata Power Limited	Mumbai	2
6	Welspun Gujarat	Anand	2
7	ABB Limited	Vadodara	3
8	Tata YUZAKI Autocomp Limited	Pune	2

Average Salary Offered Per Annum **1,80,000**

### Industrial Visits

1. TPS, GSECL, Gandhinagar
2. New Bharat Engineering
3. Consumer Education & Research Center, Ahmedabad
4. Electric Loco-shed, Chhani, Vadodara
5. T&R India. Ltd.
6. SOJA substation, Nr. Kalol
7. Gujarat poly AVX, Gandhinagar
8. Niki Cables, Rakanpur, Ahmedabad
9. TPS, Torrent power, Sabarmati, Ahmadabad
10. Sardar Sarovar Dam (Narmada), Kevadia Colony,



### Special Events

1. A Seminar on "TESTING OF ELECTRICAL EQUIPMENTS AS PER STANDARDS"
2. A Seminar on ONE DAY WORKSHOP ON "IMPROVE YOUR SOLDERING SKILLS"

### Students Academic and Cultural Achievements

- Team of Sohagia Nirav & Patel Rushabh stood first and Patel Chirag stood third in State Level students' Competition "Tech Fest-2009" organized by Institute of Diploma Studies, Nirma University on 31<sup>st</sup> January 2009..
- Won first prize at SPARK-2010, Date:25 Feb 2010 N.G.Patel Polytechnic, Bardoli Vora Sonam, Sharma Vijay and Patel Pratik





- Won first prize at CREATION-2010 Date:13<sup>th</sup> April Vidyabharti trust polytechnic, Umraha, Vor Sonam, Sharma Vijay, Patel Pratik and Thakkar Nidhi

Sr. No.	Event	Prize	Winners	Registration No
1	Long jump	2 <sup>nd</sup>	Zala Divyaraj	08DEE015
2	Volley ball	2 <sup>nd</sup>	EE team	
3	Football	2 <sup>nd</sup>	EE team	
4	High jump	3 <sup>rd</sup>	Mishra Sunil James Thomas	06DEE009
5	Table Tennis (single)	1 <sup>st</sup>	James Thomas	05DEE001
6	Table Tennis (Double)	1 <sup>st</sup>	Pragnesh Patel Vihar Patel	05DEE001 05DEE005
7	Table Tennis (Double)	2 <sup>nd</sup>	Hardik Thaker Shah Anuj	05DEE012 08DEE024
8	Mimicry	2 <sup>nd</sup>	Department wise	07DEE302
9	Mime	2 <sup>nd</sup>	Department wise	
10	Duet singing	1 <sup>st</sup>	Department wise	
11	Group singing	2 <sup>nd</sup>	05DEE219 Shah Rima	
12	Solo Dance	2 <sup>nd</sup>	Department wise	05DEE219
13	Folk Dance	2 <sup>nd</sup>	Department wise	
14	Debate	2 <sup>nd</sup>	Shah Rima	
15	Ramzat : Garbha Competition at University level	1 <sup>st</sup>	Jignasha Darji	05DEE219 05DEE023

## Best Projects Of This Year

### 1. Traffic Solver Using Micro Controller 8051:-

Traffic solver not only control the traffic  
By managing red yellow and green signal  
Periodically, it also displays down counts  
By two digit by seven segment LED display.

Special feature:-

It can sense the traffic density and if it is more than the reference it increases delay of green signals and helps in managing traffic at cross roads.

Guided by Prof. H.S. Pandya (HOD EE, IDS,NU)

Prepared By:- Sonam Vora and Nidhi Thakkar



### 2. Automatic baby cradle:-

It is motorized baby cradle that starts when baby start crying. Voice of baby is sense by a clap switch, and stops with variable timer.



Guided by Prof. H.S. Pandya (HOD, EE, IDS, NU)

Prepared By:- Bhavesh Jadav and Anuj Shah

### 3. Programmable Logic Controllers:-

Control panel is an electrical device consisting of a flat insulated surface that contains switches and dials and meters for controlling other electrical devices.

Programmable Logic Controllers are the hub of many manufacturing processes. These microprocessor based units are used in processes as simple as boxing machines to controlling and

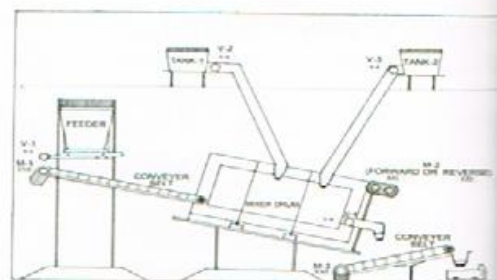
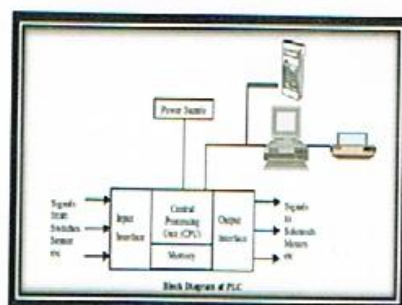




tracking sophisticated manufacturing processes. They are in virtually all new manufacturing, processing and packing equipment in one form or another. Because of their popularity in industry, it becomes increasingly more important to learn skills related to these devices.

**BLOCK DIAGRAM OF PLC:** A PLC consists of a Central Processing Unit (CPU) containing an application program and Input and Output Interface modules, which is directly connected to field I/O

devices. The program controls the PLC so that when an input signal from an input device turns ON, the appropriate response is made. The response normally involves turning ON an output signals to some



sort of o/p devices.

Guided by Prof. Astha Trivedi and Prof. Miral Shah (Asst. Professor, EE, IDS,NU)

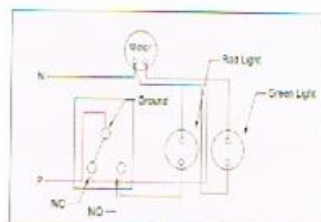
Prepared By:- Harshal Chokshi and Sunil Mishra

#### 4. Magnetic Separators For Conveyor Belts And Its Safety Devices

The project was taken from a cement industry. We have built a conveyor belt and its mechanisms which are used to transport the raw material from one place to another. A Magnetic separator is used to

Guided by Prof. Dhiren Rathod (Asst. Professor, EE, IDS, NU)

Prepared By:- Yatharth Khanna, Hemal Khatri and Vijay Sharma







## **Wearable Blood Pressure Sensor.**

**Compiled By: Prof. DHIREN RATHOD (Asst. Professor EE, IDS, NU )**

### **Device could help diagnose hypertension, heart disease.**

High blood pressure is a common risk factor for heart attacks, strokes and aneurysms, so diagnosing and monitoring it are critically important. However, getting reliable blood pressure readings is not always easy. Visits to the doctor's office can provoke anxiety that distorts blood pressure readings, and even when accurate, such visits provide only one-time snapshots of the patient's condition. To overcome these obstacles engineers have built a wearable blood pressure sensor that can provide continuous, 24-hour monitoring. Blood pressure can change from minute to minute, so continuous monitoring offers a much broader picture of cardiovascular health.

The new monitor, which loops around the wrist and the last finger, is just as accurate as traditional cuff devices but much less cumbersome, allowing it to be worn for hours or days at a time.

"The human body is so complex, but the cuff gives only snapshot data," "If you get signals all of the time you can see the trends and capture the physical condition quite well." Such devices could be used to keep tabs on hypertension as well as sleep apnea, which cause sufferers to stop breathing many times throughout the night. Eventually, doctors may be able to use data gathered from continuous monitoring to predict when a heart attack may occur.

#### **No cuff required.**

Traditional blood pressure monitoring requires a cuff, wrapped around the upper arm and inflated until blood flow is completely cut off. The examiner then gradually releases the pressure, listening to the flow until the pulse can be detected. With the new monitor, no cuff is required. Instead, the device takes advantage of a method called pulse wave velocity, which allows blood pressure to be calculated by measuring the pulse at two points along an artery.

In early models, the researchers used the heart as one of the points, with a heart monitor measuring the ECG. However, ECGs aren't always accurate, and a heart monitor can be uncomfortable, so the researchers decided to use two points on the hand instead. That posed a challenge because blood pressure in the hand varies depending on its position: If the arm is raised above the heart, the pressure will be higher than if it is below the heart. The researchers solved that dilemma by incorporating a sensor that measures acceleration in three dimensions, allowing the hand position to be calculated at any time. This not only compensates for the error due to height changes, but also allows them to calibrate the sensor for more accurate calculation of blood pressure. As the wearer raises the hand up and down, the hydrostatic pressure changes at the sensor. Correlating the change of pulse wave velocity to the hydrostatic pressure change, the system can automatically calibrate its measurement.

Once the blood pressure information is gathered, the data can be transmitted via radio signals or wireless Internet. The device runs on a tiny battery, about the same size as the ones that power watches.



## Cable Fault Locator

**Compiled by: TANNA AKASH (07DEE034)**

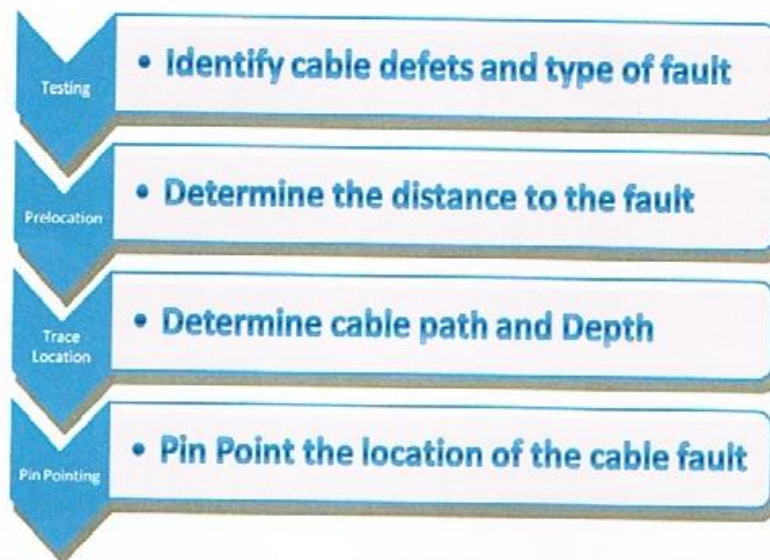
In large industries, the network of underground cable is huge and in terms of kilo meters. So due to the climate or anyhow, chances of fault are more. Some of the industries are on contract with the GEB, and many Multinational industries are having their own equipment and tools to find out the cable fault.

This activity is nothing but, find out the fault by a thumper which is designed to pick up electric field and magnetic field.

### How Cable Fault Begin

1. Water
2. Treeing
3. Corrosion
4. Poor Installation Techniques
5. Manufacturing Defect
6. Mechanical Damage

### Steps of Fault Locating



### How to Find Cable Fault

#### Cable Description:-

For finding the cable fault, it required to identify that the cable is conductor type or the insulation type.

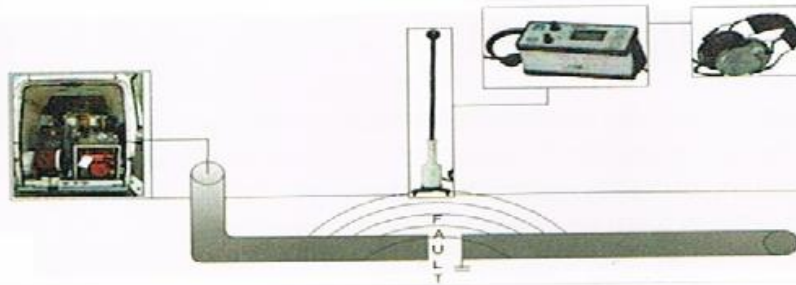


### Test:-

After finding the type of cable, it required to do the testing for checking the faulty phase among R, Y, and B. The following test are done:-

1. Insulation / Fault resistance
2. DC Hipot (Hi-Voltage)
3. Continuity
4. Radar

At a same time we are also getting the distance of fault.



As we can see in the fig. there is a vehicle of CFL. This vehicle has whole setup containing the inverter for AC to DC, step up transformer and the Monitor for visualization of the status. The distance we get by passing normal DC voltage to the cable. Somehow for finding the fault distance 3 to 4 KV (DC) is passed and the voltage travels till the fault and comes back to the main source. So at last we get the distance of the fault.

### Cable Route:-

After finding the distance it is required to trace the distance. The distance is traced from the route mark. By the metering cycle we get the nearby distance from the route mark. By:-

1. Map
2. Trace



### Pre location and Pin pointing:-

Suppose the distance we get 500 meter, the fault may be 50 meter tolerant away from 500 meter. So from figure it can identify how we get the fault by using thumper. From the CFL vehicle nearly 8 to 12 KV is given and by the placing the thumper on ground or pre located point, the magnetic and electric field pickup and we can hear some little sound from the digiphone, which is connected to the thumper. In CFL vehicle, the process is nothing, but the capacitor is continuously charging and discharging. When it is discharging through the fault, the signal is picked up by the digiphone and through ear phone we can able to hear the critical sound. Pre location can be done by:-

1. Bridge
2. Arc Reflection
3. Surge Pulse
4. Decay





Pin Pointing can be done by:-

1. Acoustic
2. Electromagnetic
3. Earth Gradient
4. Tone Generator

### Repair:-

Before repairing the cable, it required to identify the cable among all cables. The identification of the cable is done by CBCT (core balance current transformer). Among all cables, only the faulty cable will show the negative deflection. So we can identify the cable. Now we have located the fault and it's time to repair. The repair means nothing, to cut the faulty part and put one joint. Due to new generations several techniques are invented by which we can cut the cable. There are many methods for cutting the cable such as Hydraulic method.

The above figure is a set up of cutting cable by spiking. In this the cable is cutted by inserting the bullet in the device. Further, standing 10 to 15 meter away from this parameter, by pulling the string manually the cable is cut through bullet. Now here the question arise that, why we require this type of the effort we can cut by haxo also.

The answer is simple, that during the process of identification, if there is any mistake or May the cable live, it is dangerous for the person who cut the cable. So the cable is cut using special tools.

### Proof Testing:-

The proof testing is required to inspect that the fault is cleared or not. The proof testing is done by DC High Voltage



## History Of Electricity

Compiled by: MAKHIJA GOLDI (07DEE201)

The history of electricity, dates back to the to the ancient Greeks, Phoenicians, Parthians, and Mesopotamians, over two thousand years ago.

### **Ancient history**

Thales of Miletus wrote in the 6th century BC that rubbing fur on various substances, such as amber would cause a particular attraction between the two, which is now known as static electricity. The Greeks noted that the amber buttons could attract light objects such as hair and that if they rubbed the amber long enough they could even get a spark to jump. An object found in Iraq in 1938, dated to the 3rd century BC and called the Baghdad Battery, resembles a galvanic cell and is believed by some to have been used for electroplating, although there is no real consensus on what the purpose of these devices was and they were indeed electrical in nature.





### Modern history

Italian physician Girolamo Cardano wrote about electricity in *De Subtilitate* (1550) distinguishing, perhaps for the first time, between electrical and magnetic forces. In 1600 the English scientist William Gilbert, in *De Magnete*, expanded on Cardano's work and coined the New Latin word *electricus* from *electron*, the Greek word for "amber". The first usage of the word *electricity* is ascribed to Sir Thomas Browne in his 1646 work, *Pseudopodia Epidemical*.

Gilbert was followed in 1660 by Otto von Guericke, who invented an early electrostatic generator. Other pioneers were Robert Boyle, who in 1675 stated that electric attraction and repulsion can act across a vacuum; Stephen Gray, who in 1729 classified materials as conductors and insulators; and C. F. du Fay who first identified the two types of electricity that would later be called positive and negative.

The Leyden jar, a type of capacitor for electrical energy in large quantities, was invented at Leiden University by Pieter van Musschenbroek in 1745. William Watson (scientist) experimenting with the Leyden jar, discovered in 1747 that a discharge of static electricity was equivalent to an electric current.

Franklin's observations aided later scientists such as Michael Faraday, Luigi Galvani, Alessandro Volta, André-Marie Ampere, and Georg Simon Ohm whose work provided the basis for modern electrical technology. The work of Faraday, Volta, Ampere, and Ohm is honored by society, in that fundamental units of electrical measurement are named after them.

Volta discovered that chemical reactions could be used to create positively charged anodes and negatively charged cathodes. When a conductor was attached between these, the difference in the electrical potential (also known as voltage) drove a current between them through the conductor. The potential difference between two points is measured in units of volts in recognition of Volta's work.

In 1800 Volta constructed the first device to produce a large electric current, later known as the electric battery. Napoleon, informed of his works, summoned him in 1801 for a command performance of his experiments. He received many medals and decorations, including the Legion of Honor.

By the end of the 19th century electrical engineers had become a distinct profession, separate from physicists and inventors. They created companies that investigated, developed and perfected the techniques of electricity transmission, and gained support from governments all over the world for starting the first worldwide electrical telecommunication network, the telegraph network. Pioneers in this field included Werner von Siemens, founder of Siemens AG in 1847, and John Pender, founder of Cable & Wireless.

The late 19th and early 20th century produced such giants of electrical engineering as Nikola Tesla, inventor of the polyphase induction motor; Samuel Morse, inventor of a long-range telegraph; Antonio Meucci, an inventor of the telephone; Thomas Edison, inventor of the first commercial electrical energy distribution network; George Westinghouse, inventor of the electric locomotive; Charles Steinmetz, theoretician of alternating current; Alexander Graham Bell, another inventor of the telephone and founder of a successful telephone business.



## MIT Researchers Create Fibers That Can Hear and Produce Sound

Compiled by: HARDIK THAKER (08DEE024)

**New technology can change the way fabric connects us to our world.**

Imagine wearing a shirt that can act as a microphone for the world around you, or monitor your health by listening to your heart rate and blood flow. Or a piece of mesh that can float on in the ocean for satellite imaging or monitoring marine activities. Researchers from MIT have developed the next generation fabric that offers practically limitless possibilities for taking in acoustic data from the surrounding environment. Woven fibers that can "hear" and "sing" could change the way we use fabrics to interact with our environment.

MIT reports that Yoel Fink, an associate professor of materials science and principal investigator of MIT's Research Lab of Electronics, and his collaborators has hit a new milestone on making fibers more functional than they already are. The fibers they've created can both detect and produce sound, which means that a piece of woven cloth can become the equivalent of millions of acoustic sensors bundled together.

Using a conducting plastic that contains graphite, the researchers were able to produce a flexible microphone that maintains a higher viscosity than conventional piezoelectric microphone, enabling the fibers to be made at regular thicknesses. Once the fibers are made, the researchers align the piezoelectric molecules in the same direction by applying a powerful electric field. Once finished, "If you can actually hear them, these fibers," says Chocat, a graduate student in the materials science department.

"If you connected them to a power supply and applied a sinusoidal current [an alternating current whose period is very regular] then it would vibrate. And if you make it vibrate at audible frequencies and put it close to your ear, you could actually hear different notes or sounds coming out of it."

The researchers note that the technology is scale able for manufacturing, though that won't be important until there are definite uses created for the material.



# PHOTO GALLERY

