



**VBIT**

**ELECTROKZ**

**PRESENTS**

1st March 2011 Volume-I



**ELECVOICE**

*A Guide Of Simple ELECTRICALS*

CONTENTS:

Latest technology

Famous person/company

Circuit Designing

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PES



A place where we start to share and gain the technical specs on the same page with our friends and have a bit of fun in learning process...

Watch Out....!!!!

## MATH TOOL- Complex Number Conversion In SCILAB

*Dr.P.S.Subramanyam.*

**Scilab** is an open source alternative to Matlab. Convert complex matrices to/from polar (phasor) form often used in electrical engineering.

It adds only two routines: `to_r()` and `to_p()`. These routines make it easy to work with complex numbers in the polar (or phasor) form often used by electrical engineers. In polar form a complex number is written as a (magnitude, angle) pair where the angle is in degrees measured counterclockwise (CCW) from the positive real axis. In engineering texts the notation  $\text{mag} / \_ \text{angle}$  is often used, so  $10 / \_ 45$  would represent the complex number with magnitude 10 at a 45 degree CCW from the real axis. `to_r(10,45)` converts this to standard form and gives  $7.07+7.07i$ . The routines define and work with two matrix "polar forms". In the first form the magnitudes and angles are in adjacent columns of a single matrix. In the second form the magnitudes and angles are in separate matrices. The `to_r()` example at the end of the previous paragraph used the second form. The same result can be obtained using the first form via `to_r([10 45])`. `to_r()` is used to convert polar form numbers or matrices

to standard form:

```
-->// Create a 2x2 impedance matrix.
-->// The impedances are given in a mix of polar and
      standard forms.

-->Z = [to_r(100, 45) 200+%i*200; to_r(150,90) 200];
-->// Create a voltage vector V(1) = 50 / _0, V(2) = 100 /
      _30
-->V = to_r([50 0; 100 -30]);
```

Complex matrices should always be in standard form for computation.

`to_p()` is normally used only at the end of a computation to show a result in polar form:

```
-->// Calculate currents corresponding to previous Z
      and V
-->I = ZV
I =
! - 0.2947621 - 0.2717314i !
! 0.2292141 - 0.0289284i !
-->to_p(I)
ans =

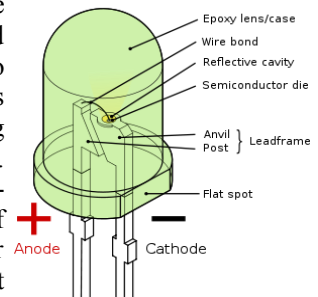
! 0.4009023 - 137.32806 !
! 0.2310324 - 7.1930998 !
```

In this example  $I(1) = -0.295 - 0.272i = 400 \text{ mA} / \_ -137.3$  degrees and

$I(2) = 0.229 - 0.029i = 231 \text{ mA} / \_ -7.2$  degrees.

## LED Technology

When a light-emitting diode is forward biased (switched on), electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence and the colour of the light. LED's are used for lighting. An LED was first made in 1962. The compact



size, the possibility of narrow bandwidth, switching speed, and extreme reliability of LED's has allowed new text and video displays and sensors to be developed, while their high switching rates are also useful in advanced communications technology. Electroluminescence was discovered in 1907 by the British experimenter H. J. Round of Marconi Labs, using a crystal of silicon carbide and a cat's whisker.

The LED consists of a chip of semiconducting material doped with impurities to create a p-n junction. As in other diodes, current flows easily from the p-side, or anode, to the n-side, or cathode, but not in the reverse direction. Charge-carriers electrons and holes flow into the junction from electrodes with different voltages. When an electron meets a hole, it falls into a lower energy level, and releases energy in the form of a photon detector. The wavelength of the light emitted, and thus its colour depends on the band gap energy of the materials forming the p-n junction. In silicon or germanium diodes, the electrons and holes recombine by a non-radioactive transition which produces no optical emission, because these are indirect band gap material. The materials used for the LED have a direct band gap with energies corresponding to near-infrared, visible or near-ultraviolet light. LEDs are usually built on an n-type substrate, with an electrode attached to the p-type layer deposited on its surface. Like other lighting devices, LED performance is temperature dependent. Most manufacturers published ratings of LEDs are for an operating temperature of 25 °C. LEDs used outdoors, such as traffic signals or in pavement signal lights, and that are utilized in climates where the temperature within the luminaries gets very hot, could result in low signal intensities or even failure.

**R.SURYA PRABHAKAR**  
**III-EEE**

**08P61A0253**

## FATHER OF ENGINEERING IN INDIA

**Born:** September 15, 1860

**Died:** April 14, 1962

**Achievements:** Architect of Krishnarajasagar dam devised steel doors to stop the wasteful flow of water in dams, honored with “**BHARATHA RATNA**”.



Sir Mokshagundam Visvesvaraya was an eminent engineer and statesman and played a key role in building of modern India.

Sir M. Visvesvaraya was born on September 15, 1860 in Muddenahalli village in the Kolar district of the erstwhile princely state of Mysore (present day Karnataka). His father Srinivasa Sastry was a Sanskrit scholar and Ayurvedic practitioner. His mother Venkachamma was a religious lady. He lost his father in his teens when he was 15 years of age.

Visvesvaraya completed his early education in Chikkaballapur and then went to Bangalore for higher education. He cleared his B.A. Examination in 1881. He got some assistance from the Government of Mysore and joined the Science College in Poona to study Engineering. In 1883 he ranked first in the L.C.E. and the F.C.E. Examinations (equivalent to B.E. Examination of Today).

When Sir M. Visvesvaraya cleared his engineering, Government of Bombay offered him a job and appointed him Assistant Engineer at Nasik. As an engineer, he achieved some marvelous feats. He planned a way of supplying water from the river Sindhu to a town called Sukkur. He devised a new irrigation system called the Block System. He devised steel doors to stop the wasteful flow of water in dams. He was the architect of the Krishnaraja Sagara dam in Mysore. The list is endless.

Sir M. Visvesvaraya voluntarily retired as Dewan of Mysore in 1918. He worked actively even after his retirement. Sir M. Visvesvaraya was honored with Bharat Ratna in 1955 for his invaluable contribution to the nation. When he reached the age of 100, the Government of India brought out a stamp in his honor. Sir Visvesvaraya passed away on April 14, 1962. at the age of 101.

### Some of the honours and laurels conferred on Sir M. Visvesvaraya

- 1904: Honorary Membership of London Institution of Civil Engineers for an unbroken period of 50 years
- 1906: "Kaisar-i-Hind" in recognition of his services
- 1911: C.I.E. (Companion of the Indian Empire) at the Delhi Darbar
- 1915: K.C.I.E. (Knight Commander of the Order of the Indian Empire)
- 1921: D.Sc. - Calcutta University
- 1931: LLD - Bombay University
- 1937: D.Litt - Benaras Hindu University
- 1943: Elected as an Honorary Life Member of the Institution of Engineers (India)
- 1944: D.Sc. - Allahabad University
- 1948: Doctorate - LLD., Mysore University
- 1953: D.Litt - Andhra University
- 1953: Awarded the Honorary Fellowship of the Institute of Town Planners, India
- 1955: Conferred ' BHARATHA RATNA'
- 1958: 'Durga Prasad Khaitan Memorial Gold Medal' by the Royal Asiatic Society Council of Bengal
- 1959: Fellowship of the Indian Institute of Science, Bangalore

**“In India Sept 15 is celebrated as Engineer's Day in memory of our beloved Sir MV”.**

*Mr.A.GopalaKrushna*

*(Asst.Professor)*

### **NTPC Limited**

India's largest power company with an installed capacity of 33,194 MWs presently operating 13 Coal based, 7 Gas based and 6 Joint Venture power stations. NTPC contributed around 1/3rd of the country's entire power generation during the year 2009-10 and plans to become a 1,28,000 MW power company by 2032. NTPC has moved ahead by diversifying its portfolio to emerge as an integrated power major with presence across the entire energy value chain.

***NTPC has been ranked No.1 Independent Power Producer in Asia and 2nd Globally at Platts Top 250 Global Energy Company ranking 2010.***

# CIRCUIT DESIGNING

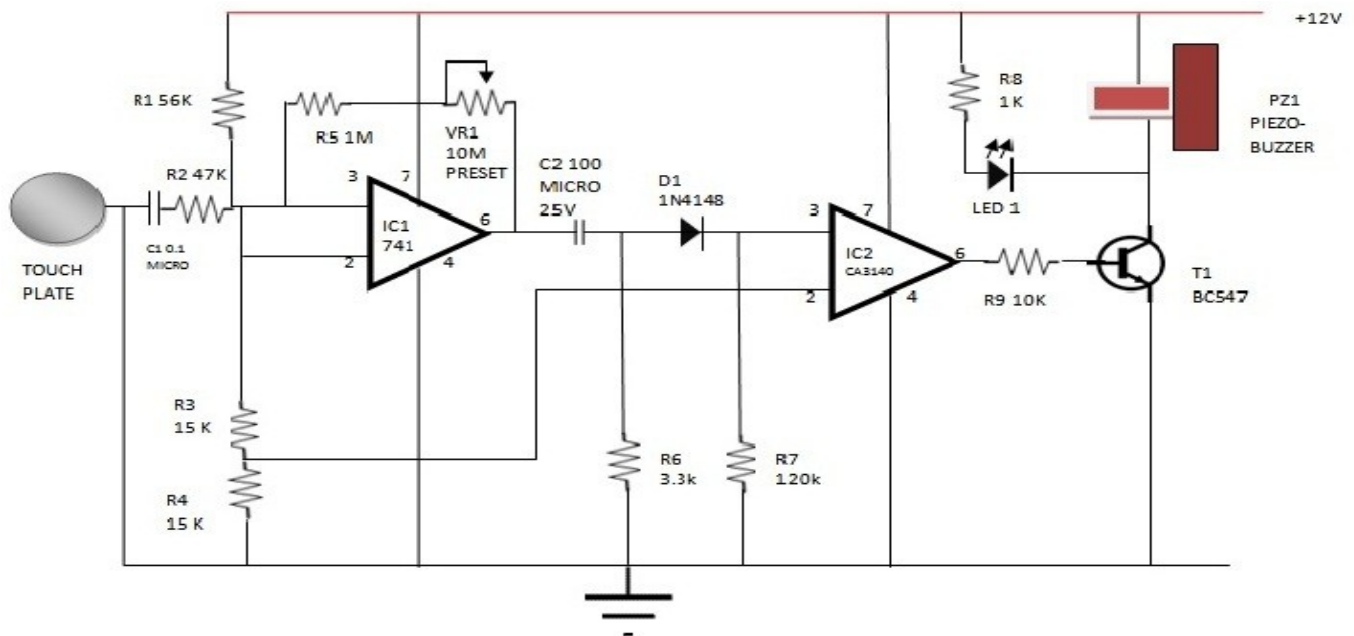
## HUM-SENSITIVE TOUCH ALARM

*K.C.B.BALASUBRAMANYAM*

Radiation signals from mains wiring can travel a few meters of distance. These can be induced by the electromagnetic field in the human body also. This touch sensitive alarm is based on generation of AC hum signal. When some one touches the touch plate, low power AC hum (the same as induced from AC wiring of the house) Is generated on the touch plate. This signal is first amplified by the high gain preamplifier build around IC 741(IC1) and then fed to another op-amp CA3140 (IC2) that is wired as a voltage comparator.

When IC2 receives the amplified signal at its input pin 3, its output goes high. As a result, transistor T1 conducts to sound the buzzer. At the same time, LED1 glows. For satisfactory working of this unit, power it from mains delivered 12V.

Assemble the circuit on a PCB and enclose in small cabinet. Use a shielded wire to connect the touch plate to circuit keeping length of wire and size of the touch plate as short as possible.



### ELECTRICAL FACTS:

- Electricity travels at the speed of light - more than 186,000 miles per second!
- A spark of static electricity can measure up to three thousand (3,000) volts.
- A bolt of lightning can measure up to three million (3,000,000) volts – and it lasts less than one second!
- Thomas Edison didn't invent the first light bulb – but he did invent one that stayed lit for more than a few seconds.



## POWER CONSUMPTION OF APPLIANCES

M.ANWESH KUMAR

Appliances-Watts	Appliances-Watts	Appliances-Watts
Coffee pot – 200watts	Garage door opener – 350watts	Compact Fluorescent (CF) vs. Incandescent Wattage*
Coffee maker – 800watts	Ceiling fan – 10-50watts	
Toaster – 800-1500watts	Table fan – 10-25watts	40 watt incan. – 11 watt CF
Popcorn popper – 250watts	Electric blanket – 200watts	60 watt incan. – 16 watt CF
Blender – 300watts	Blow dryer – 1000watts	75 watt incan. – 20 watt CF
Microwave oven– 600-1500watts	Shaver – 15watts	100 watt incan. – 30 watt CF
Waffle iron – 1200watts	Water Pik – 100watts	Hedge trimmer – 450watts
Hot plate – 1200watts	Computer...	Weed eater – 500watts
Frying pan – 1200watts	<i>laptop</i> – 20-50watts	1/4" drill – 250watts
Dishwasher – 1200-1500watts	<i>desktop</i> – 80-150watts	1/2" drill – 750watts
Gbg. disposal – 450watts	<i>printer</i> – 100watts	1" drill – 1000watts
Washing machine...	Typewriter – 80-200watts	9" disc sander – 1200watts
<i>automatic</i> – 500watts	TV (25" color) – 150watts	3" belt sander – 1000watts
<i>manual</i> – 300watts	TV (19" color) – 70watts	12" chain saw – 1100watts
Vaccum...	TV (12" B&W) – 20watts	14" band saw – 1100watts
<i>upright</i> – 200-700watts	VCR – 40watts	7 1/4" circ. saw – 900watts
<i>handheld</i> – 100watts	CD player – 35watts	8 1/4" circ. saw – 1400watts
Sewing Machine – 100watts	Portable stereo – 10-30watts	Refrig./Freezer – Conventional...
Iron – 1000watts	Clock radio – 1watts	<i>20 cubic feet</i> – 540watts
Clothes dryer...	Car stereo – 8watts	<i>16 cubic feet</i> – 475watts
<i>electric (n/a)</i> – 4000watts	Sattelite dish – 30watts	Sun Frost Refrig./Freezer ( <a href="#">DC*</a> )...
<i>gas heated</i> – 300-400watts	CB radio – 5watts	<i>16 cubic feet</i> – 112watts
Heater (n/a)...	Electric clock – 3watts	<i>12 cubic feet</i> – 70watts
<i>engine block</i> – 150-1000watts	Radio telephone...	Vestfrost Refrig./Freezer...
<i>portable</i> – 1500watts	<i>receive</i> – 5watts	<i>10.5 cubic feet</i> – 60watts
<i>waterbed</i> – 400watts	<i>transmit</i> – 40-150watts	Freezer – Conventional...
<i>stock tank</i> – 100watts	Lights...	<i>14 cubic feet FF</i> – 440watts
Furnace blower – 300-1000watts	<i>100w incan.</i> – 100watts	<i>14 cubic feet</i> – 350watts

## STUDENT COLUMN

### WINDMILL PROJECT

VBIT had started a project involving the different branches in the project as EEE in the construction of generator for the windmill and in the design of the circuit for the charge control of the battery, ECE in the design of circuit to control wind speed and direction of wings, MECH in the construction of wings and the base of windmill.

EEE Project: Generator is of single phase winding with 12 pair poles the rotor is of permanent magnet and the shaft is of stainless steel and the project is for the generation of 500watt at 12volt. The generator is attached to the wind turbines. The project also involved in the design of the circuit which controls the charge of battery.

(project team)

### AUTOMATION

**Automation** is the use of control systems and information technologies to reduce the need for human work in the production of goods and services. In the scope of industrialization, automation is a step beyond mechanization. Whereas mechanization will provide human operators with machinery to assist them with the muscular requirements of work, automation greatly decreases the need for human sensory and mental requirements as well. Automation plays an increasingly important role in the World economy and in daily experience. For example:-Telephone operators have been replaced largely by automated telephone switchboards and answering machines. Automated teller machines have reduced the need for bank visits to obtain cash and carry out transactions.

ADVANCED DISTRIBUTION AUTOMATION:-

**Advanced Distribution Automation (ADA)** is a term coined by the IntelliGrid to describe the extension of intelligent control over electrical power grid functions to the distribution level and beyond. It is related to distribution automation that can be enabled via the smart grid. The goal of Advanced Distribution Automation is real-time adjustment to changing loads, generation, and failure conditions of the distribution system, usually without operator intervention. This necessitates control of field devices, which implies enough Information technology (IT) development to enable automated decision making. Automated control of devices in distribution systems is closed-loop control of switching devices, voltage controllers, and capacitors based on recommendations of the distribution optimization algorithms.

Increasing Utilization of Existing Infrastructure: -

As a component of ADA infrastructure, the new system concepts will enable more efficient operation of the power system, allowing closer control of voltage profiles (e.g. conservation voltage reduction, closely related to voltage optimisation) and maximization of energy throughput.

NAVIN NAIDU II-EEE

## NUCLEAR WEAPONS

DJVYA & SWETHA 2nd EEE

A **nuclear weapon** is an explosive device that derives its destructive force from nuclear reactions, either fission or a combination of fission and fusion. Both reactions release vast quantities of energy from relatively small amounts of matter.

**Nuclear weapon design:-**

**Nuclear weapon designs** are physical, chemical, and engineering arrangements that cause the physics package of a nuclear weapon to detonate. There are three basic design types. In all three, the explosive energy of deployed devices has been derived primarily from nuclear fission, not fusion.

**Pure fission weapons** were the first nuclear weapons built and has so far been the only type ever used in warfare. The active material is fissile uranium (U-235) or plutonium (Pu-239), explosively assembled into a chain-reacting critical mass by one of two methods:

**Fusion-boosted fission weapons** improve on the implosion design.

In this hydrogen fuses to form helium and free neutrons. Thus the energy released from this fusion reaction is relatively negligible,

but each neutron starts a new fission chain reaction, speeding up the fission. Boosting can more than double the weapon's fission energy release.

**Two-stage thermonuclear weapons** are essentially a chain of **fission-boosted fusion weapons**, usually with only two stages in the chain. The second stage, called the "secondary," is imploded by x-ray energy from the first stage, called the "primary." This radiation implosion is much more effective than the high-explosive implosion of the primary. Consequently, the secondary can be many times more powerful than the primary, without being bigger.



### Career Opportunities:

Latest updates

For electrical there are 150 jobs in NTPC as electrical trainee executives.

In power grid there were 85 jobs for electrical trainee executive

UPSC civil services there are 880 vacancies

Qualification: degree, Age:21-30

Last date for applications is March 21

Exam is on June 12

There are jobs in NELTECH for diploma freshers and electricals

Placements in Geetanjali Institute of Technology Keesara on March 3rd for Genpact.

## MIND GAMERS-2

1. You are given two candles of equal size, which can burn 1 hour each. You have to measure 90 minutes with these candles. (There is no scale or clock). Also you are given a lighter.
2. If one tyre of a car suddenly gets stolen.... and after sometime you find the tyre without the screws how will you make your journey complete?
3. How would you catch and receive a ball in same direction? (Dropping is from north and receiving from bottom not accepted, as it is 2 directions)
4. Value of  $(x-a)(x-b)???.(x-z)$
5. How will you measure height of building when you are at the top of the building? And if you have stone with you..
6. An electrical train was on a railroad. It was going east blowing smoke. What way was it blowing the smoke?



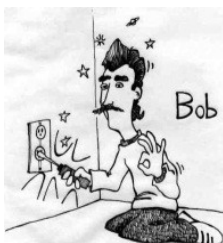
## ANSWERS OF MIND GAMERS-1

1. If u put thermometer into a tree it won't grow anymore, will just die off.
2. Only 3 points can be equidistant from each other. But if u place points in the shape of a pyramid then its possible.
3. Slice the cake.
4. Start the line complete one circle move inside circles along the line and then draw second circle. Likewise rest.
5. Factorial (factorial (0)+factorial (0)+factorial (0)+factorial (0)+factorial (0)) = 120
6. 30000

**FUNNY**

Q: Why are electricians always up to date?

A: Because they are "Current specialists".



Q: Do you know how an electrician tells if he's working with AC or DC power?

A: If it's AC, his teeth chatter when he grabs the conductors. If it's DC, they just clamp together.

## EEE UPDATES

**CONGRATULTIONS:**

Yamini.P.H 07P61A0252

Soujanya.L 07P61A0209

Anusha.M 07P61A0249

Lohitha.Y 07p61A0237

**were selected for CSS**

From 3rd year the below listed students were involved in the construction of generator for windmill project and design of circuit for charge control in our college.

M.Anwesh Kumar

K.C.B.Balasubramanyam

R.V.D.S.N.Aditya

B.Saisurya

L.Saketh

**2nd year students had been to the power grid on 18th of February.**

**Farewell party will be in the month of March.**

**Toppers of the branch:****4th year:**

V.Bharath (07P61A0229) 83%

M.V.S.L.Ravali (07P61A0246) 81%

**3rd year:**

G.Madhu Babu (08P61A0220) 81.2%

T.Swetha (08P61A0257) 80.5%

**2nd year :**

Sikta Suchismita (09P61A0241) 80.4%

P.Rajashree (09P61A0225) 79.2%

**Congratulations :**

*Our beloved faculty **B.Sarveshwar Reddy** got married with **Swapna** on 13th February 2011.*



### Welcome to the Power & Energy Society :

The **IEEE Power & Energy Society** is a worldwide, non-profit association of more than 26,000 individuals engaged in the electric power energy industry. Our mission is to be the leading provider of scientific information on electric power and energy for the betterment of society and the preferred professional development source for our members. PES members are involved in the planning, research, development, construction, installation, and operation of equipment and systems for the safe, reliable, and economic generation, transmission, distribution, measurement, and control of electric energy.

As mentioned in the previous volume of our magazine, official declaration of PES chapter at VBIT will be held in coming days. The initiation program will be held at our college premises with delegates from IEEE Hyderabad section level. A few days before the initiation a campaign of announcements will be done. The initiation program gives a wide exposure for the students to interact with people from many industries in and around Hyderabad and can consult them for future help via IEEE pathway.

We proudly announce that with support and help from our electrical and electronics department and initiative of IEEE student branch at our college it was possible to start our chapter for ELECTRICAL students as main preference. we even received appreciations from r10 SAC and Hyderabad section PES/IAS chair person Mr.Rajagopal who is DGM of NTPC south India personally. Faculty advisors for our chapter are Prof. P.S.Subramamnyam and Asst.Prof .Sarveshwar Reddy who are professional members of IEEE and PES society. Planning ahead for a technically converging thoughts and ideas towards development of mankind in engineering stream, the office bearers committee will plan the events and active participation from you people is always welcomed.

For the electronic newsletter and monthly magazine of PES-IEEE please connect to the link below

“ [www.ieee.org/pes](http://www.ieee.org/pes) ”

for scholarships and student benefits program details login to

“ [www.ieee.org/students](http://www.ieee.org/students) “

**For further details and joining into PES contact :**

**K.C.B.BALASUBRAMANYAM (09603218183)**

### VOTE OF THANKS:

We the members of ELECVOICE team thank the viewers for making it success. A special thanks to Prof.Padmavathi (HOD), faculty coordinators and EEE Dept. for the valuable support in bringing out the magazine.

### ELECVOICE COLUMN:

From this issue we would like to bring up to you the latest technology evolving in the field of electrical and the basics of core field. We are glad to say that we have the magazine as a e-book in our college site “[www.vbithyd.ac.in](http://www.vbithyd.ac.in)”.

We from the next issue are going to announce the best article of the magazine for that I request the viewers to send the articles The articles should be of their own .We also invite for the answers for mind gamers in every issue .

Our mail id [elecvoice11@gmail.com](mailto:elecvoice11@gmail.com) .

*“The theme of the next monthly is  
how to capture the thunder lightning and  
how to generate the electricity at home”*

*For more details :*

**M.ANWESH KUMAR(09705936134)**

### **Faculty Coordinators:**

*B.Sarveshwar Reddy*

*Ch.Koteswara Rao*

### **Student Coordinators:**

#### **III-EEE**

*M.Anwesh Kumar*

*K.C.B.Balasubramanyam*

*R.Surya Prabhakar*

#### **II-EEE**

*A.Vishal Goud*

*B.H.Nanda Deep*

*P.Navin Naidu*

*M.Varun Teja*

*L.Chaitanya Kumar*

*Akash Singh*