



# **MALLA REDDY ENGINEERING COLLEGE FOR WOMEN**

**Autonomous Institution – UGC, Govt. of India**

**Accredited by NBA & NAAC with 'A' Grade**

**NIRF Indian Ranking, Accepted by MHRD, Govt. of India**

**Maisammaguda, Dhulapally, Secunderabad – 500 010, Telangana**

**A.Y : 2019-20**

**VOL.1**

Under  
Student Chapter IEEE, IETE & Technical Association Electropheenix

# **ELEKTOR**

**HALF YEARLY TECHNICAL MAGAZINE**

**DEPARTMENT OF  
ELECTRICAL & ELECTRONICS ENGINEERING**

**EEE**

**DEPARTMENT VISION**

- To develop competitive industry ready electrical engineers by establishing traditions, which will foster creativity and growth of excellence to effectively meet the technological requirements..

**Vision****DEPARTMENT MISSION**

- To develop proficiency by imparting application oriented knowledge and inculcate analytical thinking to solve the technological problems associated with analyzing, designing and testing electrical systems.

**Mission****ABOUT THE DEPARTMENT**

The Department of Electrical & Electronics Engineering is accredited by NBA, with an intake of 60 students. The Dept. has state of the art laboratories with latest softwares like MATLAB, ORCAD, SCI LAB, PSPICE and Multisim. We have well qualified faculty members. Several faculty members have received their best teacher awards from institutions of International repute and have been working on research and development projects and regularly publish their work in international journals and conferences. EEE department faculty teams attained patent rights for their technological innovations. The Dept. established IEEE, ISTE student chapters under which it organizes National Level Technical Symposium -FUTURE SASTRA & State Level Technical Symposium- MEDHA every academic year. The Dept. organized National conference on "Emerging Trends in Electrical Systems & Engineering" NCETESE, International Conference on "Emerging Trends in Electrical Systems & Engineering"(ICETESE) every year since 2014, The Dept. organizes Faculty Development Programmes, Refresher courses and workshops in different streams and Student Development Programmes like Workshops, intra college conferences, Industrial visits , Guest lectures and our students actively participate in hackathon programmes conduct at state and National level. Our students are actively participated and won prizes in curricular activities organized by other colleges. The Dept. also organizes regular student seminar sessions of two hours per week for I to IV B.Tech student to enhance their all round performance.

The Dept. also offers value added certification Courses on oxford, Microsoft, CISCO certification through Oxford University, Microsoft Innovation Centre and CISCO Networking Academy respectively. The College Offers Campus Recruitment Training Programmes in collaboration with TIME and FACE Institutions. The Department also publishes the Registered Journal "International Journal of Research in Signal Processing, Computing and Communication-System Design (IJRSCSD) with an ISSN: 2395-3187.

## PO'S

<b>PO1</b>	<b>Engineering knowledge</b>	An ability to apply knowledge of mathematics (including probability, statistics and discrete mathematics), science, and engineering for solving Engineering problems and modeling
<b>PO2</b>	<b>Problem analysis</b>	An ability to design, simulate and conduct experiments, as well as to analyze and interpret data including hardware and software components
<b>PO3</b>	<b>Design / development of solutions</b>	An ability to design a complex electronic system or process to meet desired specifications and needs
<b>PO4</b>	<b>Conduct investigations of complex problems</b>	An ability to identify, formulate, comprehend, analyze, design synthesis of the information to solve complex engineering problems and provide valid conclusions.
<b>PO5</b>	<b>Modern tool usage</b>	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice
<b>PO6</b>	<b>The engineer and society</b>	An understanding of professional, health, safety, legal, cultural and social responsibilities
<b>PO7</b>	<b>Environment and sustainability</b>	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and demonstrate the knowledge need for sustainable development.
<b>PO8</b>	<b>Ethics</b>	Apply ethical principles, responsibility and norms of the engineering practice
<b>PO9</b>	<b>Individual and team work</b>	An ability to function on multi-disciplinary teams.
<b>PO10</b>	<b>Communication</b>	An ability to communicate and present effectively
<b>PO11</b>	<b>Project management and finance</b>	An ability to use the modern engineering tools, techniques, skills and management principles to do work as a member and leader in a team, to manage projects in multi-disciplinary environments
<b>PO12</b>	<b>Life-long learning</b>	A recognition of the need for, and an ability to engage in, to resolve contemporary issues and acquire lifelong learning

---

PSO'S

---

The graduates of the department will attain:

**PSO1:** Analyze, Design and Implement application specific electrical system for complex engineering problems, Electrical And Electronics Circuits, Power Electronics and Power Systems by applying the knowledge of basic science, Engineering mathematics and engineering fundamentals

**PSO2:** Apply modern software tools for design, simulation and analysis of electrical systems to engage in life- long learning and to successfully adapt in multi disciplinary environments

**PSO3:** Solve ethically and professionally various Electrical Engineering problems in societal and environmental context and communicate effectively

## PEO'S

**PEO1-PROFESSIONAL DEVELOPMENT**

To develop in the students the ability to acquire knowledge of Mathematics, Science & Engineering and apply it professionally within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability with due ethical responsibility.

**PEO2-CORE PROFICIENCY**

To provide ability to identify, formulate and solve engineering problems with hands on experience in various technologies using modern tools necessary for engineering practice to satisfy the needs of society and the industry.

**PEO3- TECHNICAL ACCOMPLISHMENTS**

To equip the students with the ability to design, experiment, analyze and interpret in their core applications through multi disciplinary concepts and contemporary learning to build them into industry ready graduates.

**PEO4- PROFESSIONALISM**

To provide training, exposure and awareness on importance of soft skills for better career and holistic personality development as well as professional attitude towards ethical issues, team work, multidisciplinary approach and capability to relate engineering issues to broader social context.

**PEO5- LEARNING ENVIRONMENT**

To provide students with an academic environment and make them aware of excellence, leadership, written ethical codes and guidelines and the life-long learning to become a successful professional in Electrical and Electronics Engineering

## MESSAGES

## Founder Chairman's Message

**Ch. Malla Reddy**

Founder Chairman, MRGI  
Hon'ble Minister, Govt. of Telangana State

MRECW has made tremendous progress in all areas and now crossing several milestones within a very short span of time and now I feel very happy to know that the students and faculty of the EEE department of MRECW are bringing out the volume-1 of the Technical magazine Elektor in A.Y 2019-20. As I understand this magazine is intended to bring out the inherent literary talents in the students and the teachers and also to inculcate leadership skills among them. I am confident that this issue will send a positive signal to the staff, students and the persons who are interested in the educational and literary activities

## Principal's Message

I congratulate the department of EEE, MRECW for bringing out the first issue of the prestigious half yearly department technical Magazine Elektor under A.Y: 2019-20, I am sure that the magazine will provide a platform to the students and faculty members to expand their technical knowledge and sharpen their hidden literary talent and will also strengthen the all round development of the students. I am hopeful that this small piece of literary work shall not only develop the taste for reading among students but also develop a sense of belonging to the institution as well. My congratulations to the editorial board who took the responsibility for the arduous task most effectively. I extend best wishes for the success of this endeavor.

**Dr. Y. Madhatee Latha**

Principal

## HOD'S MESSAGE

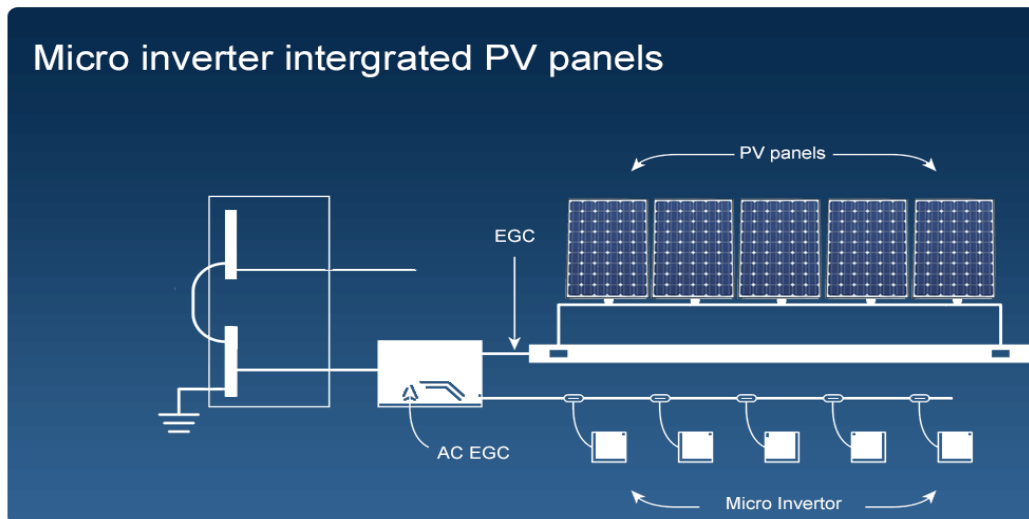
It is an occasion of great pride and satisfaction for the department of EEE, MRECW to bring out the first issue of the half yearly of the Technical magazine Elektor under A.Y:2019-20, it gives me immense pleasure to note that the response to the magazine has been over whelming. The wide spectrum of articles gives us a sense of pride that our students and faculties possess creative potential and original thinking in ample measures. Each article is entertaining interesting and absorbing. I applaud the contributors for their stimulated thoughts and varied hues in articles contributed by them.

**Prof. N. Raveendra**

HOD

## FACULTY ARTICLES

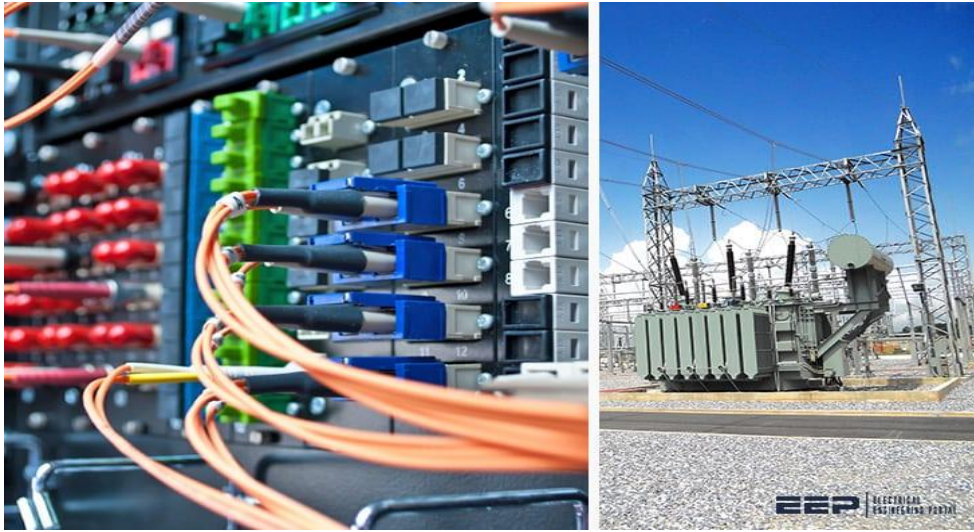
### MICROINVERTERS



In microinverter architectures, each solar panel has its own inverter that performs power conversion for each module. Microinverter architectures are more expensive than the other two but offer the highest power optimization and design flexibility and also avoid a single point of failure. Microinverters have several advantages over conventional inverters. The main advantage is that small amounts of shading, debris, or snow lines on any one solar module, or even a complete module failure, do not disproportionately reduce the output of the entire array. Each microinverter harvests optimum power by performing MPPT for its connected module. Simplicity in system design, lower amperage wires, simplified stock management, and added safety are other factors introduced with the microinverter solution. The primary disadvantages of a microinverter include a higher initial equipment cost per peak watt than the equivalent power of a central inverter since each inverter needs to be installed adjacent to a panel (usually on a roof). This also makes them harder to maintain and more costly to remove and replace. Some manufacturers have addressed these issues with panels with built-in microinverters. The main focus is on microinverters, particularly microinverters that are based on the interleaved flyback converter topology. Solar energy systems based on microinverter architectures are gaining in popularity as they are less prone to shading and PV cell malfunction since each solar panel in a system has its own low power inverter. A number of microinverters are single-stage flyback inverters that are based on the DC–DC flyback topologies.

**Mr. Brahmam Yadav**  
Asst. Professor

## AUTOMATED ADVANCED DISTRIBUTION SYSTEM



Advanced Distribution Automation (ADA) is a term coined by the IntelliGrid project in North America 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 electrical power grid is typically separated logically into transmission systems and distribution systems. Electric power transmission systems typically operate above 110kV, whereas Electricity distribution systems operate at lower voltages. Normally, electric utilities with SCADA systems have extensive control over transmission-level equipment, and increasing control over distribution-level equipment via distribution automation. However, they often are unable to control smaller entities such as Distributed energy resources (DERs), buildings, and homes. It may be advantageous to extend control networks to these systems for a number of reasons: Distributed generation is increasingly important in power grids around the world. This generation can help to support local power grids in the presence of blackouts, and ease the load on long-distance transmission lines, but it can also destabilize the grid if not managed correctly".[1] Usually, utility control centers are unable to manage distributed generators directly, and this may be a valuable capability in the future.

**Mr. V. Naresh**  
**Asst. Professor**



## STUDENT ARTICLES

## SATELLITE RADIO



Satellite radio is defined by the International Telecommunication Union. The satellite signals are broadcast nationwide, across a much wider Geographical area than terrestrial radio stations, and the service is primarily intended for the occupants of motor vehicles. It is available by subscription, mostly commercial free, and offers subscribers more stations and a wide variety of programming options than terrestrial radio. Satellite radio technology was inducted into the space Foundation Space Technology Hall of Fame in 2002. Satellite radio uses 2.3GHz S band in North America for nationwide digital broadcasting. In other part so the world, satellite radio uses the 1.4GHz L band allocated for DAB.



V.SANTHOSHI  
17RH1A0259

## ARTIFICIAL INTELLIGENCE IN POWER SYSTEMS

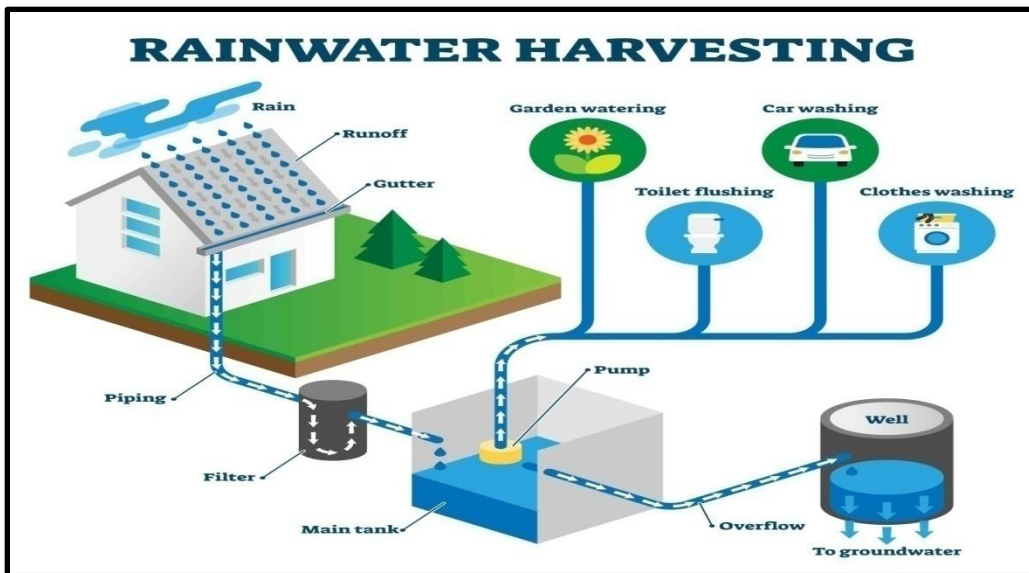


In today's world we require a continuous & definitive supply of electricity for proper functioning in modern and advanced society. AI (Artificial Intelligence) (AI) may be a field that was found on the idea of human intelligence where AI precisely simulates natural intelligence. AI (Artificial Intelligence) is the mixture of expert tasks, mundane tasks, and formal tasks. Power Systems were used from the late 19th century and they are one of the essential needs that we would like in our modern, developing day-to-day life. Power systems are used for transmission and delivering electricity to all or any machines. AI (Artificial Intelligence) plays a vital role in power systems where they solve different problems in power systems like scheduling, calculating, statistics, forecast. As AI (Artificial Intelligence) was being developed in several fields we could see the impact that it made on the facility systems also, the humanly solved mathematical functions were solved by machines and every one the tasks are performed by the machines. AI techniques became popular for solving different problems in power systems like control, planning, scheduling, forecast, etc.



**K BINDU MADAVI**  
**16RH1A0226**

## RAIN WATER HARVESTING

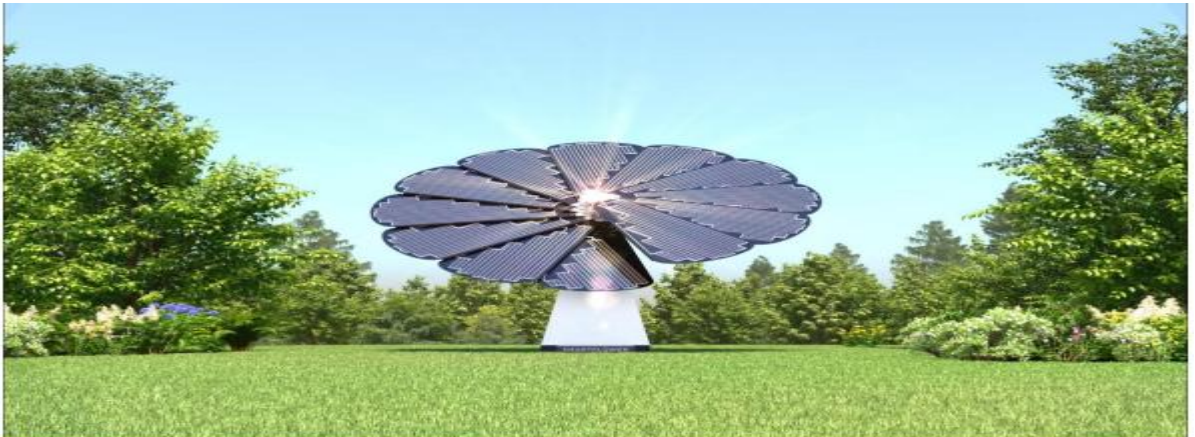


Water Scarcity is serious problem throughout the world for both Urban and rural community. Rain water harvesting is defined as the process of augmenting the natural infiltration of rain water or surface water into the ground by some artificial methods. In rooftop harvesting, the roof becomes the catchments and the rain water is collected from the roof of the house/building it can either be stored in a tank or diverted to recharge pit etc. This method is less expensive and very effective and if implemented properly helps in augmenting the ground water level of the area. The methods of rooftop rain water harvesting are recharge pit, recharge trenches, storage tanks, abandoned dug wells, bore- well. The present study tells us 2,87,536 liters of water harvested per year in four numbers of underground storage tanks. Rain water harvesting is the small-scale collection and storage runoff for irrigated agriculture, is recognized as a sustainable strategy for ensuring food security, especially in monsoonal landscapes in the developing world.



17RH1A0233

## SMART FLOWER



The Smart flower, or Solar Sunflower, is a blend between solar panels and art. It is a photovoltaic (PV) system that has been incorporated to bring visibility to solar technology, and at the same time to enhance the landscape and architecture they complement via aesthetics. Smart flowers have been modelled like a sunflower, and they have all the individual components, including solar panels, inverters, wiring, batteries, and others to generate electricity and store it. Similar to a sunflower, smart flower systems unfold their 12-petal panels at sunrise, move toward the sun at a 90-degree angle, and almost immediately start producing electricity. As smart flowers are equipped with the dual-axle sun tracking, the system tracks the sun throughout the day. During the sunset, the petals of a smart flower automatically fold until the next morning. When the sun rises in the morning, the smart flower unfolds its petals automatically, direct its modular solar fan towards the sun and starts generating electricity. Because of the dual-axle sun tracking, the fan moves along with the sun during the day. Due to the integrated astronomical control system, the modular solar fan of Smart flower moves both horizontally and vertically as the sun changes its position, regardless of a cloudy sky. This particular feature ensures optimum alignment with the sun, which is an exact angle of  $90^\circ$ . It works like this throughout the day, even when the sun is down on the horizon during the winter. Smart flower cleans itself up of dust or snow by folding and unfolding itself. So, Smart flower is like a self-cleaning device. Solar modules that heat up produces less electricity than cooling module. When the smart flower operates during the day, the sensors keep monitoring the wind speed.



17RH1A0236

## AUTOMATIC RAILWAY CONTROL GATE



In our article we are minimizing accident of level crossing between the railroads & highway. This types of accidents are happens due to the miss communication of workers. So, to overcome this difficulty we are implementing this project. In this paper PIC16F877A microcontroller is used to minimize the human effort & control the whole circuit. Two types of sensors is used & output of the first IR sensor are placed near to gate it receives the signal from arrival of the train then send output signal to microcontroller. Microcontroller output to motor driver then motor rotates in clockwise direction, and then gate is close. Second sensor is placed another side of gate those are sense departure of the train & send signal to microcontroller. In general, Railway gates are opened or closed manually by a gate keeper. The information about arrival of train for opening or closing of door is received from nearby station. But some railway crossings are totally unmanned and many railway accidents occur at these unmanned level crossings. To avoid the human intervention at level crossings completely, we need to automate the process of railway gate control. We have two different Automatic Railway Gate Control circuits mentioned in this article: using 8051 and AVR.



17RH1A0216

## SOLAR MOBILE CHARGER



Solar cell phone chargers use solar panels to charge cell phone batteries. They can be used when no electricity supply is available—either mains or, for example, a vehicle battery—and are sometimes suggested as a way to charge phones without consuming mains electricity, unlike electrical cell phone chargers. Some can also be used as a conventional charger by plugging into an electrical outlet. Some chargers have an internal rechargeable battery which is charged in sunlight and then used to charge a phone; others charge the phone directly. Solar chargers can be used to charge other rechargeable devices with requirements similar to a mobile phone, such as Bluetooth headsets and music players. Being liberated from wires and power outlets is just one of the many advantages of having solar panels on cell phones. As the world's resources are diminishing, governments are encouraging for a green movement to help conserve the limited supply. Solar energy is gaining popularity because of the free and abundant energy. This fact alone will save customers money on their electric bills. The energy is also clean and produces no hazardous waste like some of the other power generation resources.



17RH1A0228

## DRONES FOR SMART AGRICULTURE



One of main source of income in of India is Agriculture. The production rate of crops in agriculture is based on various parameters like temperature, humidity, rain, etc. Which are natural factors and not in farmers control. The field of agriculture is also depends on some of factors like pests, disease, fertilizers, etc which can be control by giving proper treatment to crops. Pesticides may increase the productivity of crops but it also affects on human health. So the main aim of this paper is to design agriculture drone for spraying pesticides. In this paper, we are going to discus different architecture based on unmanned aerial vehicles (UAVs). The use of pesticides in agriculture is very important to agriculture and it will be so easy if will use intelligent machines such as robots using new technologies. This paper gives the idea about various technologies used to reduce human efforts in various operations of agriculture like detection of presence of pests, spraying of UREA, spraying of fertilizers, etc. This paper describes the development of quad copter UAV and the spraying mechanism. In this paper we also discuss integration of sprayer module to quad copter system.



**17RH1A0238**

## SOLAR POND TECHNOLOGY



The Sun heats the water during the day. Then, at night, hot water is pumped into heat-storage tanks. Heat generated by solar ponds has many applications and can cut down on the use of fossil fuels. The heat extracted from the pond enables the production of chemicals, food, textiles, and other industrial products. Heat generated by solar ponds has many applications and can cut down on the use of fossil fuels. The heat extracted from the pond enables the production of chemicals, food, textiles, and other industrial products.

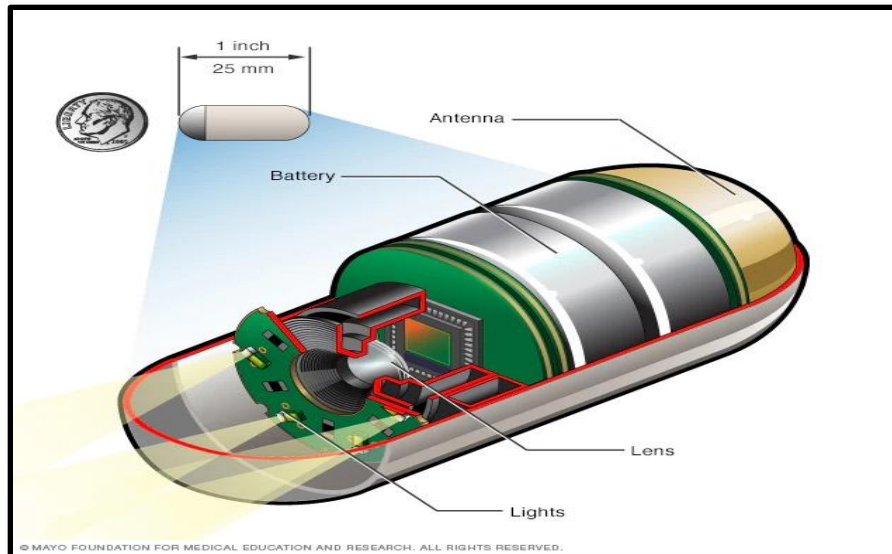
The solar pond works on a very simple principle. It is well-known that water or air is heated they become lighter and rise upward e.g. a hot air balloon. Similarly, in an ordinary pond, the sun's rays heat the water and the heated water from within the pond rises and reaches the top but loses the heat into the atmosphere. The net result is that the pond water remains at the atmospheric temperature. The solar pond restricts this tendency by dissolving salt in the bottom layer of the pond making it too heavy to rise. Though solar ponds can be constructed anywhere, it is economical to construct them at places where there is low cost salt and bittern, good supply of sea water or water for filling and flushing, high solar radiation, and availability of land at low cost. Coastal areas in Tamil Nadu, Gujarat, Andhra Pradesh, and Orissa are ideally suited for such solar ponds.



17RH1A0249



## PILL CAMERA

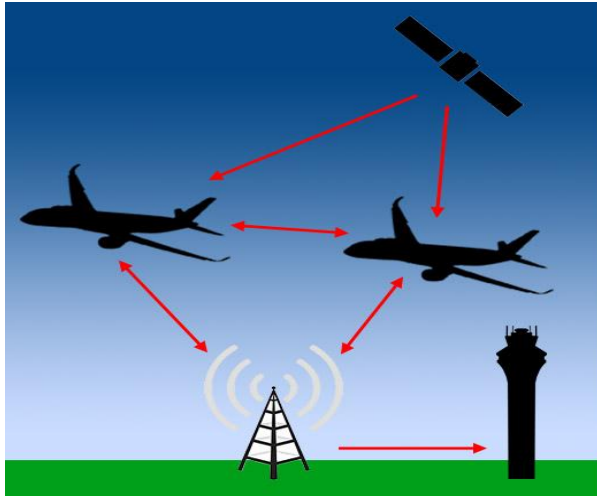


The aim of technology is to make products in a large scale for cheaper prices and increased quality. The current technologies have attained a part of it but the manufacturing technology is at micro level. The future lies in manufacturing product right from the molecular level. Research in this direction started way back in eighties. At that time manufacturing at molecular and atomic level was laughed about. But due to advent of nanotechnology we have realized it to a certain level One such product manufactured is PILL CAMIRA, which is used for the treatment of cancer, ulcer and anemia. It has made revolution in the field of medicine. At that time manufacturing at molecular and atomic level was laughed But due to advent of nanotechnology we have realized it to a certain level One such product manufactured is PILL CAMERA, which is used for the treatment of cancer, ulcer and anemia. It has made evolution in the field of medicine. The Pill Cam is a plastic capsule about the size of a large vitamin or fish oil pill (26 mm). It's equipped with a tiny camera and light inside so it can capture color close-ups of your digestive tract, specifically the small intestine. It also has an antenna to transmit images to a wireless recorder that patients wear on a specially designed sensor belt. The doctor syncs the recorder to the Pill Cam before you swallow it.



17RH1A0247

## AIRCRAFT GPS TRACKING



1. GPS satellites provide location information to ADS-B equipped aircraft.
2. ADS-B equipped aircraft transmit altitude, speed, and velocity information to other ADS-B equipped aircraft and ADS-B ground stations
3. ADS-B ground receive stations provide aircraft location back to other aircraft, as well as air traffic control centers.

GPS aircraft tracking is a means of tracking the position of an aircraft fitted with a GPS receiver. By communication with GPS satellites, detailed real-time data on flight variables can be passed to a server on the ground. This server stores the flight data, which can then be transmitted via telecommunications networks to organizations wishing to interpret it. There are several active aircraft tracking systems available on the market that use the "bread-crumbs approach" to SAR. Rather than relying on an emergency locator transmitter to transmit upon impact, the next generation of emergency locating devices is active tracking devices that send position reports at regular time intervals. If the unit stops transmitting upon impact, the historical transmissions will give the last known location of the aircraft, its speed, direction and altitude. Tracking as an alternative or complement to current technology has recently been encouraged by the Coroner in New Zealand. There are several active aircraft tracking systems available on the market that use the "bread-crumbs approach" to SAR. Rather than relying on an emergency locator transmitter to transmit upon impact, the next generation of emergency locating devices are active tracking devices that send position reports at regular time intervals. If the unit stops transmitting upon impact, the historical transmissions will give the last known location of the aircraft, its speed, direction and altitude.



**B SPANDANA**  
**16RH1A0206**

---

IMPORTANT WEBSITES

---

[www.ieee.org/india](http://www.ieee.org/india)

[www.engineering.careers360](http://www.engineering.careers360)

[www.technologyreview.com](http://www.technologyreview.com)

[www.mathworks.in/products/matlab/](http://www.mathworks.in/products/matlab/)

[www.microwaves101.com/](http://www.microwaves101.com/)

[www.eee.utoronto.ca/student-life-links](http://www.eee.utoronto.ca/student-life-links)

<https://www.eee.org/>

[Science Commons.org](http://Science.Commons.org)

[MathGV.com:](http://MathGV.com)

<http://www.engineeringchallenges.org/>

<http://engineering.stanford.edu/announcement/stanford-announces-16-online-courses-fall-quart>

<http://www.tryengineering.org/>

<http://www.engineergirl.org/>

<http://www.discoverengineering.org/>

<http://www.eng-tips.com/>

<http://electricalbaba.com>

<http://efymagonline.com/>

<http://circuitglobe.com>

[www.techdoct.com](http://www.techdoct.com)

[www.howstuffworks.com](http://www.howstuffworks.com)

<http://nptel.iitm.ac.in>

<http://www.opencircuitdesign.com/>

<http://www.futuresinengineering.com/>

# ELEKTOR



## MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

**Autonomous Institution – UGC, Govt. of India**

**Accredited by NBA & NAAC with 'A' Grade**

**NIRF Indian Ranking, Accepted by MHRD, Govt. of India**

**Maisammaguda, Dhulapally, Secunderabad – 500 010, Telangana**

