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ELECTRONIKA

Yearly News letter

(Only for Internal Circulation)

HOD's Message

- Education, particularly Technical Education is playing a vital role in the development of the country by creating skilled manpower, enhancing industrial productivity and improving the quality of life. People talks about wonders of the world and include structures and monuments but Communication Engineering is the greatest wonders of the world that even no one imagined. To continuously spread the quality technical education we the Dept of Electronics and Communication Engineering are committed to take up responsibility of the holistic growth of the pupil coming in to its folds, is committed to make all possible efforts to help in realizing their dreams as well as the society to which he or she hails from.

Prof. Rupesh Dubey

HOD EC Dept.

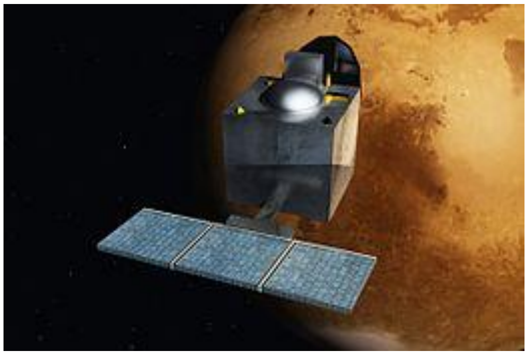
Mars Orbiter Mission

The **Mars Orbiter Mission** (**MOM**), informally called **Mangalyaan** (Sanskrit for "Mars-Craft"), is a Mars orbiter launched into Earth orbit on 5 November 2013 by the Indian Space Research Organization (ISRO). It is expected to enter orbit around Mars on 24 September 2014. The mission is a "technology demonstrator" project aiming to develop the technologies required for design, planning, management, and operations of an interplanetary mission.

The Mars Orbiter Mission probe lifted-off from the First Launch Pad at Satish Dhawan Space Centre SHAR, Sriharikota, Andhra Pradesh, using a Polar Satellite Launch Vehicle (PSLV) rocket C25 at 09:08 UTC (14:38 IST) on 5 November 2013. The launch window was approximately 20 days long and started on 28 October 2013. The MOM probe spent about a month in Earth orbit, where it made a series of seven altitude-raising orbital man oeuvres before trans-Mars injection on 30 November 2013 (UTC).

It is India's first interplanetary mission and, if successful, ISRO would become the fourth space agency to reach Mars, after the Soviet space program, NASA, and the European Space Agency. The spacecraft is currently being monitored from the Spacecraft Control Centre at ISRO Telemetry, Tracking and Command Network (ISTRAC) in Bangalore with support from Indian Deep Space Network (IDSN) antennae at Byalalu.

. This article is about the Indian Mars probe. For other Mars orbiters, see List of missions to Mars



Artist's rendering of the MOM orbiting Mars

Mission type	Mars orbiter

Operator	ISRO
COSPAR ID	2013-060A
SATCAT №	39370
Website	www.isro.org/mars/home.aspx
Mission duration	6 months (planned)
Spacecraft properties	
Bus	I-1K
Manufacturer	ISAC
Launch mass	1,337 kg (2,948 lb)
Dry mass	500 kg (1,100 lb)
Payload mass	15 kg (33 lb)
Dimensions	1.5 meters (4 ft 11 in) cube
Power	840 watts
Start of mission	
Launch date	5 November 2013, 09:08 UTC
Rocket	PSLV-XL C25
Launch site	Satish Dhawan FLP
Contractor	ISRO
Orbital parameters	

Reference system	Areocentric
Periareon	365.3 km (227.0 mi)
Apoareon	80,000 km (50,000 mi)
Inclination	150.0°
Period	76.72 hours
Epoch	Planned
Mars orbiter	
Orbital insertion	24 September 2014 (Planned)

History

The MOM mission concept began with a feasibility study in 2010, after the launch of lunar satellite Chandrayaan-1 in 2008. The government of India approved the project on 3 August 2012, after the Indian Space Research Organization completed ₹1.25 billion (US$21 million) of required studies for the orbiter. The total project cost may be up to ₹ 4.54 billion (US$75 million). The satellite costs ₹1.53 billion (US$25 million) and the rest of the budget has been attributed to ground stations and relay upgrades that will be used for other ISRO projects.

The space agency had initially planned the launch on 28 October 2013 but was postponed to 5 November 2013 following the delay in ISRO's spacecraft tracking ships to take up pre-determined positions due to poor weather in the Pacific Ocean. Launch opportunities for a fuel-saving Hohmann transfer orbit occur about every 26 months, in this case, 2016 and 2018. The Mars Orbiter's on-orbit mission life will be between six and ten months.

Assembly of the PSLV-XL launch vehicle, designated C25, started on 5 August 2013. The mounting of the five scientific instruments was completed at ISRO Satellite Centre, Bangalore, and the finished spacecraft was shipped to Sriharikota on 2 October 2013 for integration to the

PSLV-XL launch vehicle. The satellite's development was fast-tracked and completed in a record 15 months. Despite the US federal government shutdown, NASA reaffirmed on 5 October 2013 it would provide communications and navigation support to the mission. ISRO chairman stated in November 2013 that if the MOM and NASA's orbiter MAVEN were successful, they would complement each other in findings and help understand Mars better.

The ISRO plans to send a follow up mission in the 2017-2020 timeframe with a greater scientific payload.

Team

Some of the scientists working on the *Mars Orbiter Mission* project are:

- K. Radhakrishan – Chairman, ISRO
- A. S. Kiran Kumar – Director, SAC
- Mylswamy Annadurai – Programme Director, MOM
- B. S. Chandrashekar – Director, ISTRAC
- P. Robert – Operations Director, MOM
- Subbiah Arunan – Project Director, MOM
- V. Kesavaraju – Post-Launch Mission Director, MOM
- P. Ekambaram – Operations Director, MOM
- P. Kunhikrishnan – Launch Mission Director, PSLV-XL
- S. K. Shivkumar – Orbiting payload Director, ISAC
- B. Jayakumara – Launch Vehicle Director, PSLV

Objectives

The primary objective of the Mars Orbiter Mission is to showcase India's rocket launch systems, spacecraft-building and operations capabilities. Specifically, the primary objective is to develop the technologies required for design, planning, management and operations of an interplanetary mission, comprising the following major tasks:

- design and realization of a Mars orbiter with a capability to perform Earth-bound man oeuvres, cruise phase of 300 days, Mars orbit insertion / capture, and on-orbit phase around Mars;
- deep-space communication, navigation, mission planning and management;
- Incorporate autonomous features to handle contingency situations.

The secondary objective is to explore Mars' surface features, morphology, mineralogy and Martian atmosphere using indigenous scientific instruments.

Spacecraft

Mass: The lift-off mass was 1,350 kg (2,980 lb), including 852 kg (1,878 lb) of propellant.

Dimensions: Cuboid in shape of approximately 1.5 m (4 ft 11 in)

Bus: The spacecraft's bus is a modified I-1 K structure and propulsion hardware configurations similar to Chandrayaan 1, India's lunar orbiter that operated from 2008 to 2009, with specific improvements and upgrades needed for a Mars mission. The satellite structure is of aluminum and composite fiber reinforced plastic (CFRP) sandwich construction.

Power: Electric power is generated by three solar array panels of 1.8 m × 1.4 m (5 ft 11 in × 4 ft 7 in) each (7.56 m^2 (81.4 sq ft) total), for a maximum of 840 W generation in Martian orbit. Electricity is stored in a 36 Ah Li-ion battery.

Propulsion: Liquid fuel engine of 440 N thrust is used for orbit raising and insertion in Martian orbit. The orbiter also has eight 22 N thrusters for attitude control or orientation.

Communications: Two 230 W TWTAs and two coherent transponders. The antenna array consists of a low-gain antenna, a medium-gain antenna and a high-gain antenna. The High-gain antenna system is based on a single 2.2-metre reflector illuminated by a feed at S-band. It is used to transmit and receive the telemetry, tracking, commanding and data to and from the Indian Deep Space Network.

Payload

Scientific instruments

LAP	Lyman-Alpha Photometer	1.97 kg
MSM	Methane Sensor For Mars	2.94 kg
MENCA	Mars Exospheric Neutral Composition Analyzer	3.56 kg
TIS	Thermal Infrared Imaging Spectrometer	3.2 kg
MCC	Mars Color Camera	1.27 kg

The 15 kg (33 lb) scientific payload consists of five instruments:

Atmospheric studies

- Lyman-Alpha Photometer (LAP) – a photometer that measures the relative abundance of deuterium and hydrogen from Lyman-alpha emissions in the upper atmosphere. Measuring the deuterium/hydrogen ratio will allow an estimation of the amount of water loss to outer space.
- Methane Sensor For Mars (MSM) – will measure methane in the atmosphere of Mars, if any, and map its sources.

Particle environment studies

- Mars Exospheric Neutral Composition Analyzer (MENCA) – is a quadrupole mass analyzer capable of analyzing the neutral composition of particles in the exosphere.

Surface imaging studies

- Thermal Infrared Imaging Spectrometer (TIS) – will measure the temperature and emissivity of the Martian surface, allowing for the mapping of surface composition and mineralogy of Mars.
- Mars Color Camera (MCC) – will provide images in the visual spectrum, providing context for the other instruments.

Telemetry and command

Further information: Telemetry and Telecommand

The Indian Space Research Organization Telemetry, Tracking and Command Network performed navigation and tracking operations for the launch with ground stations at Sriharikota, Port Blair, Brunei and Biak in Indonesia, and after the spacecraft's apogee became more than 100,000 km, two large 18-metre and 32-metre diameter antennas of the Indian Deep Space Network started to be utilized. The 18-metre diameter dish-antenna was used for communication with the craft till April 2014, after which the larger 32-metre antenna started to be used. NASA's Deep Space Network is providing position data through its three stations located in Canberra, Madrid and Goldstone on the US West Coast during the non-visible period of ISRO's network. The South African National Space Agency's (SANSA) Hartebeesthoek (HBK) ground station is also providing satellite tracking, telemetry and command services.

Mission profile

Timeline of operations					
Phase	**Date**	**Event**	**Detail**	**Result**	
Geocentric phase	5 November 2013 09:08 UTC	Launch	Burn time: 15:35 min in 5 stages	Apogee: 23,550 km	
	6 November 2013 19:47 UTC	Orbit raising manoeuvre	Burn time: 416 sec	Apogee: 23,550 km to 28,825 km	
	7 November 2013 20:48 UTC	Orbit raising man oeuvre	Burn time: 570.6 sec	Apogee: 28,825 km to 40,186 km	
	8 November 2013 20:40 UTC	Orbit raising man oeuvre	Burn time: 707 sec	Apogee: 40,186 km to 71,636 km	
	10 November	Orbit raising man	Incomplete burn	Apogee:	

	2013 20:36 UTC	oeuvre		71,636 km to 78,276 km	
	11 November 2013 23:33 UTC	Orbit raising man oeuvre (supplementary)	Burn time: 303.8 sec	Apogee: 78,276 km to 118,642 km	
	15 November 2013 19:57 UTC	Orbit raising man oeuvre	Burn time: 243.5 sec	Apogee: 118,642 km to 192,874 km	
	30 November 2013, 19:19 UTC	Trans-Mars injection	Burn time: 1328.89 sec	Successful heliocentric insertion	
Heliocentric phase	December 2013 – September 2014	En route to Mars – The probe is currently travelling a distance of 780 million kilometers (484 million miles) in a parabolic trajectory around the Sun to reach Mars. As of 9 June 2014, the probe has travelled 460 million km in its path to Mars, and was about 100 million km away from Earth. This phase plan includes up to four trajectory corrections if needed.			
	11 December 2013 01:00 UTC	1st Trajectory correction	Burn time: 40.5 sec	Success	
	9 April 2014	2nd Trajectory correction (planned)	Unnecessary	Rescheduled for 11 June 2014	
	11 June 2014 11:00 UTC	2nd Trajectory correction	Burn time: 16 sec	Success	
	August 2014	3rd Trajectory	Unnecessary		

		correction (planned)			
	14 September 2014	3rd Trajectory correction			
Areocentric phase	24 September 2014	Mars orbit insertion			

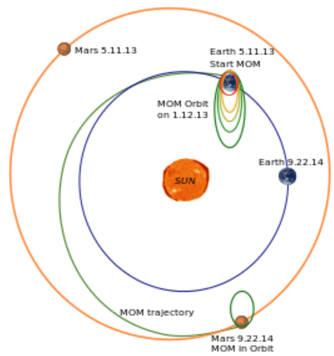
Launch

As originally conceived, ISRO would have launched MOM on its new Geosynchronous Satellite Launch Vehicle (GSLV), but the GSLV has failed twice in two space missions in 2010, ISRO is still sorting out issues with its cryogenic engine, and it was not advisable to wait for the new batch of rockets since that would have delayed the MOM project for at least three years. ISRO had to make a choice between delaying the Mars Orbiter Mission and switching to the less-powerful PSLV. They opted for the latter. There is no way to launch on a direct-to-Mars trajectory with the PSLV as it does not have the power. Instead, ISRO launched it into Earth orbit first and slowly boosted it into an interplanetary trajectory using multiple perigee burns to maximize the Oberth effect.

On 19 October 2013, ISRO chairman K. Radhakrishnan announced that the launch had to be postponed by a week as a result of a delay of a crucial telemetry ship reaching Fiji Islands. The launch was rescheduled for 5 November 2013. ISRO's PSLV-XL placed the satellite in Earth orbit at 09:50 UTC, on 5 November 2013, with a perigee of 264.1 km, an apogee of 23,903.6 km, and inclination of 19.20 degrees, with both the antenna and all three sections of the solar panel arrays deployed. During the first three orbit raising operations, ISRO progressively tested the spacecraft systems.

The orbiter's dry mass is 500 kg (1,100 lb), and it carries 852 kg (1,878 lb) of fuel and oxidizer. Its main engine, which is a derivative of the system used on India's communications satellites, uses the bipropellant combination mono-methyl-hydrazine and di-nitrogen tetroxide to achieve the thrust necessary for escape velocity from Earth. It will also be used to slow down the probe for Mars orbit insertion and subsequently, for orbit corrections.

Orbit raising manoeuvres



Orbit trajectory diagram (not to scale)

Several orbit raising operations were conducted from the Spacecraft Control Centre (SCC) at ISRO Telemetry, Tracking and Command Network (ISTRAC) at Peenya, Bangalore on 6, 7, 8, 10, 12 and 16 November by using the spacecraft's on-board propulsion system and a series of perigee burns. The aim was to gradually build up the necessary escape velocity (11.2 km/s) to break free from Earth's gravitational pull while minimizing propellant use. The first three of the five planned orbit raising man oeuvres were completed with nominal results, while the fourth was partially successful. However, a subsequent supplementary man oeuvre raised the orbit to the intended altitude aimed for in the original fourth man oeuvre. A total of six burns were completed while the spacecraft remained in Earth orbit, with a seventh burn conducted on 30 November to insert MOM into a heliocentric orbit for its transit to Mars.

The first orbit-raising man oeuvre was performed on 6 November 2013 at 19:47 UTC when the 440 newtons (99 lb_f) liquid engine of the spacecraft was fired for 416 seconds. With this engine firing, the spacecraft's apogee was raised to 28,825 km, with a perigee of 252 km. The second orbit raising man oeuvre was performed on 7 November 2013 at 20:48 UTC, with a burn time of 570.6 seconds resulting in an apogee of 40,186 km. The third orbit raising man oeuvre was performed on 8 November 2013 at 20:40 UTC, with a burn time of 707 seconds resulting in an apogee of 71,636 km.

The fourth orbit raising man oeuvre, starting at 20:36 UTC on 10 November 2013, imparted an incremental velocity of 35 m/s to the spacecraft instead of the planned 135 m/s as a result of under burn by the motor. Because of this, the apogee was boosted to 78,276 km instead of the planned 100,000 km. When testing the redundancies built-in for the propulsion system, the flow to the liquid engine stopped, with consequent reduction in incremental velocity. During the fourth orbit burn, the primary and redundant coils of the solenoid flow control valve of 440 Newton liquid engine and logic for thrust augmentation by the attitude control thrusters were being tested. When both primary and redundant coils were energized together during the planned modes, the flow to the liquid engine stopped. Operating both the coils simultaneously is not possible for future operations; however they could be operated independently of each other, in sequence. As a result of the fourth planned burn coming up short, an additional unscheduled burn was performed on 12 November 2013 that increased the apogee to 118,642 km, a slightly higher altitude than originally intended in the fourth man oeuvre. The apogee was raised to 192,874 km on 15 November 2013, 19:57 UTC in the final orbit raising man oeuvre.

Trans-Mars injection

Further information: Trans-Mars Injection

On 30 November 2013 at 19:19 UTC, a 23-minute engine firing initiated the transfer of MOM away from Earth orbit and on heliocentric trajectory toward Mars. The probe is now travelling a distance of 780 million kilometers (484 million miles) to reach Mars.

Current status

Travelling at a speed of 1.55 km per second, Mangalyan crossed half way to Mars on 9 April 2014. As of 3 September 2014, the spacecraft is three weeks away from Mars orbit insertion.

Trajectory correction man oeuvres

Four trajectory corrections were originally planned, but only three will be carried out.

The first trajectory correction man oeuvre (TCM) was carried out on 11 December 2013, 01:00 UTC, by firing the 22 Newton’s (4.9 lb_f) thrusters for duration of 40.5 seconds. As observed in April 2014, MOM is following the designed trajectory so closely that the trajectory correction man oeuvre planned in April 2014 was not required. The second trajectory correction man oeuvre was performed on 11 June 2014, at 16:30 hrs IST by firing the spacecraft's 22 Newton thrusters for duration of 16 seconds. The third planned trajectory correction man oeuvre was postponed, due to the orbiter's trajectory closely matching the planned trajectory.

Mars orbit insertion

The current plan is for insertion into Mars orbit on 24 September 2014, approximately 2 days after the arrival of NASA's MAVEN orbiter. MOM will be set on a highly elliptical orbit around Mars, with a period of 76.7 hours and a planned periapsis of 365 km (227 mi) and apoapsis of 80,000 km (50,000 mi).

TWO WEEK ISTE "ANALOG ELECTRONICS" WORKSHOP CONDUCTED BY IIT KHARAGPUR:

The two week workshop on Analog Electronics was conducted by IIT Kharagpur in the duration of 4th June 2013 to 14th June 2013. The work shop was online workshop in which participants attended the important lectures online through various remote centers and IPS was one of them.

The work was focused on basic fundamentals of diodes, transistors, and FETs etc. Also some important concept on biasing of transistors, JFET and MOSFET were taught. Analogue electronics (or analog in American English) are electronic systems with a continuously variable signal, in contrast to digital electronics where signals usually take only two different levels. The term "analogue" describes the proportional relationship between a signal and a voltage or current that represents the signal. The word analogue is derived from the Greek word analogous meaning "proportional"

An analogue signal uses some attribute of the medium to convey the signal's information. For example, an aneroid barometer uses the angular position of a needle as the signal to convey the information of changes in atmospheric pressure. Electrical signals may represent information by changing their voltage, current, frequency, or total charge. Information is converted from some other physical form (such as sound, light, temperature, pressure, position) to an electrical signal by a transducer which converts one type of energy into another (e.g. a microphone).

The signals take any value from a given range, and each unique signal value represents different information. Any change in the signal is meaningful, and each level of the signal represents a different level of the phenomenon that it represents. For example, suppose the signal is being used to represent temperature, with one volt representing one degree Celsius. In such a system 10 volts would represent 10 degrees, and 10.1 volts would represent 10.1 degrees.

Another method of conveying an analogue signal is to use modulation. In this, some base carrier signal has one of its properties altered: amplitude modulation (AM) involves altering the amplitude of a sinusoidal voltage waveform by the source information, frequency modulation (FM) changes the frequency. Other techniques, such as phase modulation or changing the phase of the carrier signal, are also used.

In an analogue sound recording, the variation in pressure of a sound striking a microphone creates a corresponding variation in the current passing through it or voltage across

It. An increase in the volume of the sound causes the fluctuation of the current or voltage to increase proportionally while keeping the same waveform or shape.

Mechanical, pneumatic, hydraulic and other systems may also use analogue signals.

Since the information is encoded differently in analogue and digital electronics, the way they process a signal is consequently different. All operations that can be performed on an analogue signal such as amplification, filtering, limiting, and others, can also be duplicated in the digital domain. Every digital circuit is also an analogue circuit, in that the behavior of any digital circuit can be explained using the rules of analogue circuits.

The first electronic devices invented and mass-produced were analogue. The use of microelectronics has made digital devices cheap and widely available.

Because of the way information is encoded in analogue circuits, they are much more susceptible to noise than digital circuits, since a small change in the signal can represent a significant change in the information present in the signal and can cause the information present to be lost. Since digital signals take on one of only two different values, a disturbance would have to be about one-half the magnitude of the digital signal to cause an error; this property of digital circuits can be exploited to make signal processing noise-resistant. In digital electronics, because the information is quantized, as long as the signal stays inside a range of values, it represents the same information. Digital circuits use this principle to regenerate the signal at each logic gate, lessening or removing noise.

A number of factors affect how precise a signal is, mainly the noise present in the original signal and the noise added by processing. See signal-to-noise ratio. Fundamental physical limits such as the shot noise in components limits the resolution of analogue signals. In digital electronics additional precision is obtained by using additional digits to represent the signal; the practical limit in the number of digits is determined by the performance of the analogue-to-digital converter (ADC), since digital operations can usually be performed without loss of precision. The ADC takes an analogue signal and changes into a series of binary numbers. The ADC may be used in simple digital display devices e. g. thermometers, light meters but it may also be used in digital sound recording and in data acquisition. However, a digital-to-analogue converter (DAC) is used to change a digital signal to an analogue signal. A DAC takes a series of binary numbers and converts it to an analogue signal. It is common to find a DAC in the gain-control system of an amp which in turn may be used to control digital amplifiers and filters

Analogue circuits are harder to design, requiring more skill, than comparable digital systems. This is one of the main reasons why digital systems have become more common than analogue devices. An analogue circuit must be designed by hand, and the process is much less automated than for digital systems. However, if a digital electronic device is to interact with the real world, it will always need an analogue interface. For example, every digital radio receiver has an analogue preamplifier as the first stage in the receive chain.

Ref. Mangalyan Wikipedia

TWO DAY WORKSHOP ON SENSOR BASED AUTOMATED ROBOT "TECHNOPETZ":

A two day workshop was organized by EC department of IES-IPS, in the duration of 22nd and 23rd Oct 2012. The workshop was aimed towards concept of robotics and designing of basic block of robotics. Sensor-based robot control may be viewed as a hierarchical structure with multiple observers. Actuator, feature-based, and recognition observers provide the basis for multilevel feedback control at the actuator, sensor, and world coordinate frame levels, respectively. The analysis and design of feature-based control strategies to achieve consistent dynamic performance is addressed. For vision sensors, such an image-based visual servo control is shown to provide stable and consistent dynamic control within local regimes of the recognition observer. Simulation studies of two- and three-degree-of-freedom systems show the application of an adaptive control algorithm to overcome unknown and nonlinear relations in the feature to world space mapping.

Robotics is the branch of mechanical engineering, electrical engineering and computer science that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. These technologies deal with automated machines that can take the place of humans in dangerous environments or manufacturing processes, or resemble humans in appearance, behavior, and/or cognition. Many of today's robots are inspired by nature contributing to the field of bio-inspired robotics.

The concept of creating machines that can operate autonomously dates back to classical times, but research into the functionality and potential uses of robots did not grow substantially until the 20th century. Throughout history, robotics has been often seen to mimic human behavior, and often manage tasks in a similar fashion. Today, robotics is a rapidly growing field, as technological advances continue; research, design, and building new robots serve various practical purposes, whether domestically, commercially, or militarily. Many robots do jobs that are hazardous to people such as defusing bombs, mines and exploring shipwrecks.

INDUSTRIAL VISIT ON "CSIR –CSIO NETWORK" & "NOKIA SEMEN" IN CHANDIGARH:

Industrial Visit on "CSIR –CSIO Network" & "NOKIA Semen" in Chandigarh was organized by EC dept from 02nd April 2013 to 10th April 2013. The Central Scientific Instruments Organization (CSIO), a constituent unit of Council of Scientific & Industrial Research (**CSIR**), is a premier national laboratory dedicated to research, design and development of scientific and industrial instruments. It is a multi-disciplinary and multi-dimensional apex industrial research & development organization in the country to stimulate growth of Instrument Industry in India covering wide range and applications.

CSIO is a multi-disciplinary organization having well equipped laboratories manned by highly qualified and well trained staff with infrastructural facilities in the areas of Agrionics; Medical Instrumentation and Prosthetic Devices; Optics and Cockpit based Instrumentation; Fiber/Laser

Optics based Sensors & Instrumentation; Analytical Instrumentation; Advanced Materials based Transducers etc. Large number of instruments ranging from simple to highly sophisticated ones, have been designed and developed by the Institute and their know-how's have been passed on to the industry for commercial exploitation. Having contributed substantially towards the growth of the scientific instruments industry in the country, CSIO enjoys high degree of credibility among the users of the instruments as well as the instrument industry.

NOKIA SIEMENS NETWORKS is a venture of the two big companies that shaped the communications industry. Siemens has excelled in the communications industry since the mid 19th century and Nokia excels in the development of mobile communications and became the world leader in mobile communications.

The company in India has five product Business Units providing a full range of products and applications for fixed, mobile and converged networks namely Service Core & Applications, Broadband Access, Radio Access, IP Transport, and Operations & Business Software.

INDUSTRIAL VISIT AT SCIENTECH TECHNOLOGY:

Department of EC, IES IPS academy organized Industrial Visit at Scientech Technology on 20th April 2013. **Scientech Technologies Pvt. Ltd.** is has a strong presence in educational, health care, environmental and industrial sectors. With more than 550 diverse products in the above fields, it is making the lives of people better and this planet happier.

The strength of Scientech is its efficient team. Spread across 12 different offices across the country, it works tirelessly to evolve effective and innovative solutions. Scientech also has a full-fledged R&D team that ensures that its products are cutting-edge. A strong service support team guarantees complete satisfaction for the customers. Powered with these factors, Scientech has a pan-India presence and exports to more than 65 countries across the world. Leading technological solution provider with a global footprint, Scientech Technologies has grown into a renowned company with a satisfied customer base in over 65 countries. We have become a pioneer serving in the field of Test & Measurement, Instruments, Technology Training

Equipments, Simulation/Teaching Software and Online Education. We serve a variety of academic disciplines and offer a wide range of products, avant-garde educational and interactive classroom solutions (Interactive white board, Response systems etc). Our products help students

Transform their ideas into reality. Students being our prime focus, our products are useful from middle school to college / university levels.

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(Only for Internal Circulation)

HOD's Message 

Education, particularly Technical Education is playing a vital role in the development of the country by creating skilled manpower, enhancing industrial productivity and improving the quality of life. People talks about wonders of the world and include structures and monuments but Communication Engineering is the greatest wonders of the world that even no one imagined. To continuously spread the quality technical education we the Dept of Electronics and Communication Engineering are committed to take up responsibility of the holistic growth of the

Prof. Rupesh Dubey

HOD EC Dept.

iPhone 4S

The **iPhone 4S** is a touch screen-based smart phone developed, manufactured, and released by Apple Inc. It is the fifth generation of the iPhone, succeeding the iPhone 4 and preceding the iPhone 5. Announced on October 4, 2011 at Apple's Cupertino campus, its media coverage was accompanied by the death of former Apple CEO and co-founder Steve Jobs on the following day.

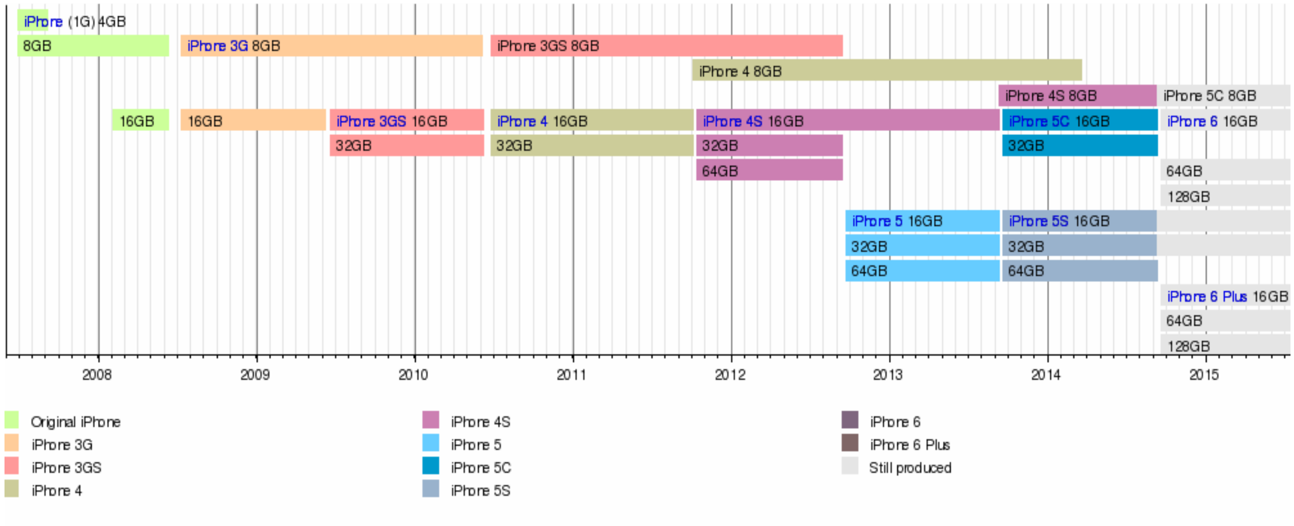
Available for pre-order on October 7 and coming to mainstream availability in retail stores on October 14 in the United States, Australia, Canada, the United Kingdom, France, Germany, and Japan, sales peaked over its predecessor with over a million sales in the first twenty-four hours of preorder availability and over four million sales in the first four days of retail availability. Further worldwide rollout, including 22 additional countries on October 28, came over the next several months.

Retaining the external design of the iPhone 4, the 4S hosted revised hardware specifications, most notably an upgrade to the Apple A5 chipset, and an 8-megapixel camera with 1080p video recording. It debuted with iOS 5, the fifth major version of Apple's mobile operating system, that introduced features including iCloud, iMessage, Notification Center, Reminders, and Twitter integration. It also debuted a 4S-exclusive intelligent personal assistant named Siri that was later included in future generations of mobile Apple products.

Reception to the iPhone 4S was generally favorable. Reviewers noted Siri, the new camera, and processing speeds as significant advantages over the prior model. It was succeeded by the iPhone 5 as Apple's flagship phone on September 12, 2012. The iPhone 4S remained in production, albeit being sold at a lower price point and with reduced storage. It was officially discontinued September 9, 2014 following the announcement of the iPhone 6

.

Timeline of models



Sources: Apple press release library

Ref. Iphone 4S Wikipedia

<u>10 FACTS ABOUT INVENTIONS</u>

1. Argentina celebrates its Inventors’ Day on September 29, which is the anniversary of the birthday of ballpoint pen pioneer Laszlo Biro…

2. In Thailand, Inventors’ Day is February 2, for that was the day in 1993 when King Bhumibol received a patent for a slow speed surface aerator.

3. 2013 is the centenary of the inventions of both the modern brassiere and the crossword puzzle.

4. Alexander Graham Bell’s patent for a telephone is listed as ‘Improvement to Telegraphy’…

5. …and Douglas Engelbart’s 1968 invention of the computer mouse calls it an ‘X-Y Position Indicator for a Display System’.

6. Although modern tinned food dates back to 1810, the tin-opener was not invented until 1870.

7. Leonardo da Vinci invented an alarm clock that woke the sleeper by gently rubbing his feet.

8. The dance known as the foxtrot was invented by Harry Fox in 1914.

9. The Vacant/Engaged sign for public toilets was patented by A Ashwell of Herne Hill in 1883.

10. “To invent, you need a good imagination and a pile of junk” (Thomas Edison).Ten things you never knew about... inventions WILLIAM HARTSTON

CHARGE PHONE BYSOUND NOISE:

A new smart phone prototype can be charged by ambient sound, such as cheers from a football field or chatter from a coffee shop — though don’t expect to cut your charging cable anytime soon. Scientists from Queen Mary University of London and researchers at Nokia built a mobile device that can be refueled when everyday background noise, including traffic and music, is converted into electricity. The energy harvester, or Nano-generator, works using the piezoelectric property of zinc oxide. When the zinc oxide Nano-rods are squashed, stretched or bent, they produce a voltage. The Nano-generator is designed to allow this voltage to be used to power a device — in this case, a mobile phone.

The technology uses tiny strands of zinc oxide sandwiched between two electrodes. A sound absorbing pad on top vibrates when sound waves hit it, causing the tiny zinc oxide wires to compress and release. This movement generates an electrical current that can then be used to charge a battery.

A prototype of the technology was able to convert sound of around 100 decibels - the equivalent of noisy traffic - to generate 50 mill volts of electricity. "This is not enough to charge a phone properly, but by altering the material the wires are made able to produce more energy at lower sounds levels.

BRAIN TO BRAIN COMM. USING INTERNET:

By using internet linked electrons-follow gram (eeg) and robot assisted & image guided trans-cranial magnetic stimulation (tms) technology, researchers are able to transmit the think ink of a man to the brain of another man who are far about thousand miles away from each other.

in this system researchers send words by a brain computer interface (bci) device, and the words are being received by a device called computer brain interface (cbi).the major advantage of this technology is there is no any need of brain surgery for transmission and reception of the signals from one brain to another brain.

This is the first brain to brain online conversation in world. The conversation is established between India and France. The words “hola” & “chiaao” scented from India to France. This technology is developed by neuroscientist and robotics engineers of harword medical school and France respectively.

With the help of this technology, people are able to make communication without speaking or writing. This is the revolution of direct brain to brain communication.

Ref. Internet Data

SPORTS ACTIVITY "SWARANJALI 2013"

1. Manjeesh Kumar Pimplekar	
• Swaranjali Cricket	Winner in 2nd year (2012-13)
• Swaranjali Football	3rd place in 2nd year (2012-2013
• Nodal Cricket (2012-13)	1st , 2nd and 3rd year (Quarter finals)
• Kho- Kho Nodal (2012-13)	participated
• Anand Mela Swaranjali	2nd place in 2nd year (2012-13)
• Rangoli Swaranjali	Participated in 2nd year (2012-13)
• Poster making	Participated in 2nd year(2012-13)
2. Neha Gupta	
• Anand Mela Swaranjali	2nd place in 2nd year (2012-13)
• Volleyball Nodals	2nd year (Pre quarter finals) (2012-13)
• Table Tennis	2nd position in 2nd year (2012-13)
3. Poorvi Jain	
• Academics	2nd rank in class in 4th semester (2012-13)
• Poster Competition	Participated 2nd year(2012-13)
4. Akshay Singh	
• Anand Mela Swaranjali	2nd place in 2nd year (2012-13)
• Volleyball Swaranjali	Winner in 2nd year (2012-13)
• Kho- kho Nodal	3rd Position in 2nd year (2012-13)
• Poster Making	Participated in 2nd year (2012-13)
5. Kanchan Naidu	
• Anand Mela Swaranjali	2nd place in 2nd year (2012-13)
• Handball Nodals	Pre Quarter finalist in 2nd year (2012-13)
6. Gaurav Kant Rathore	
• Cricket National level	Participated in 2nd year (2012-13)
• Nodals Cricket	Participated (2012-13)

• Quiz Competition	Participated
• Swaranjali Cricket	Winner in 2^{nd} year (2012-13)
7. Harshit Sharma	
• Swaranjali Cricket	Winner in 2^{nd} year (2012-13)
• Table Tennis	Bits Pilani (Semi finals) 2012-13
	Swaranjali participated(2012-13)
8. Shiva Singh	
• Volleyball	
	Winner in Swaranjali 2012-13.
• Cricket Swaranjali	Participated 2012-13
9. Stuti Goyal	
• Academics	Branch Topper
• Basketball Nodals	Participated 2012-13
10. Hemant Raj	
• Volleyball Swaranjali	Winner in 2^{nd} year 2012-13
• Anand Mela Swaranjali	2^{nd} position in 2^{nd} year (2012-13)
Robo Challenge :- Arpan Kumar Jain Abhishek Gupta Alok Panday Gaurav Chourasiya Nikesh Kumar Singh	Winner in 2012 i.e. 2^{nd} year

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