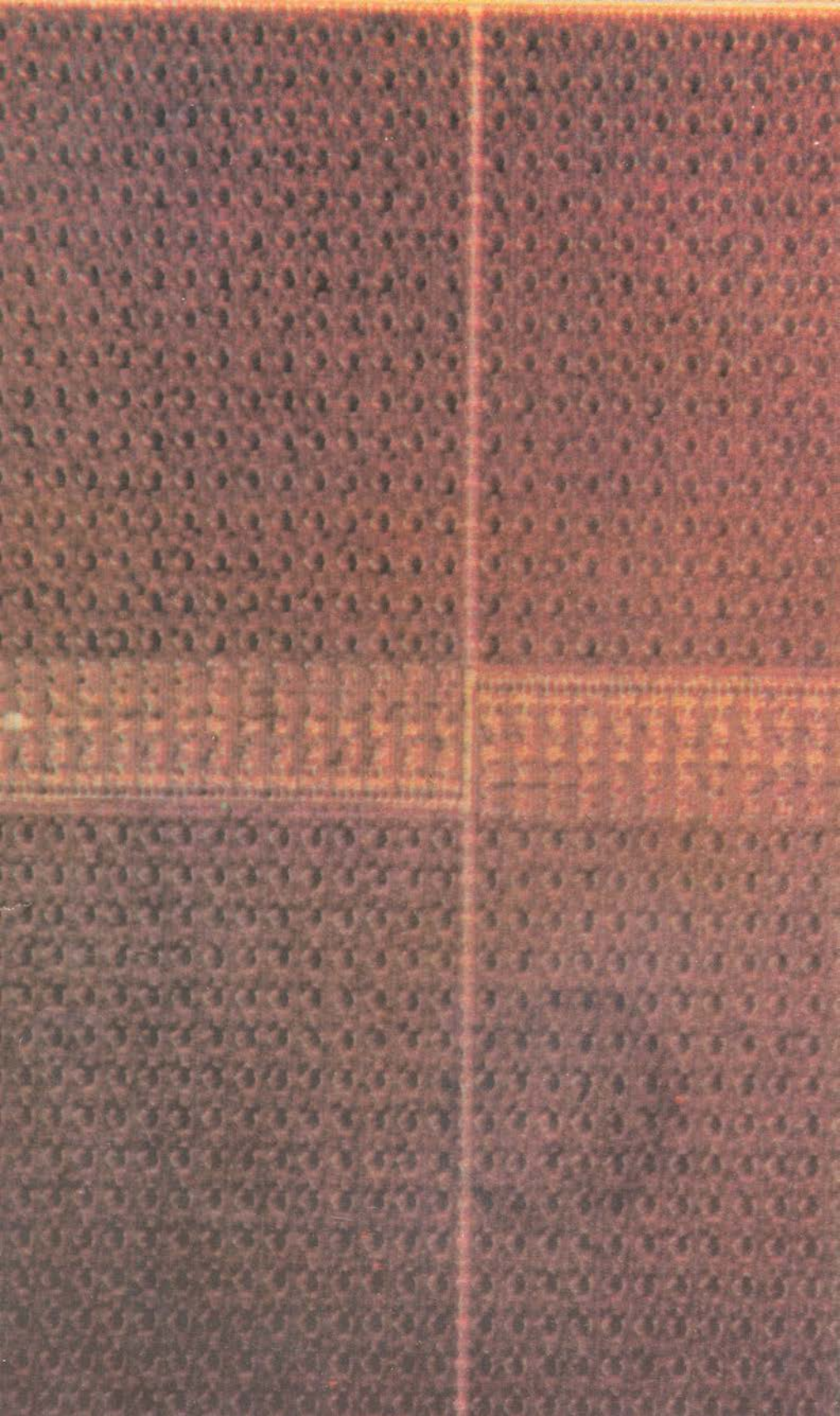
ELECTRONICS GALLERY

BIRLA INDUSTRIAL &
TECHNOLOGICAL MUSEUM
19A GURUSADAY ROAD
CALCUTTA - 700 019



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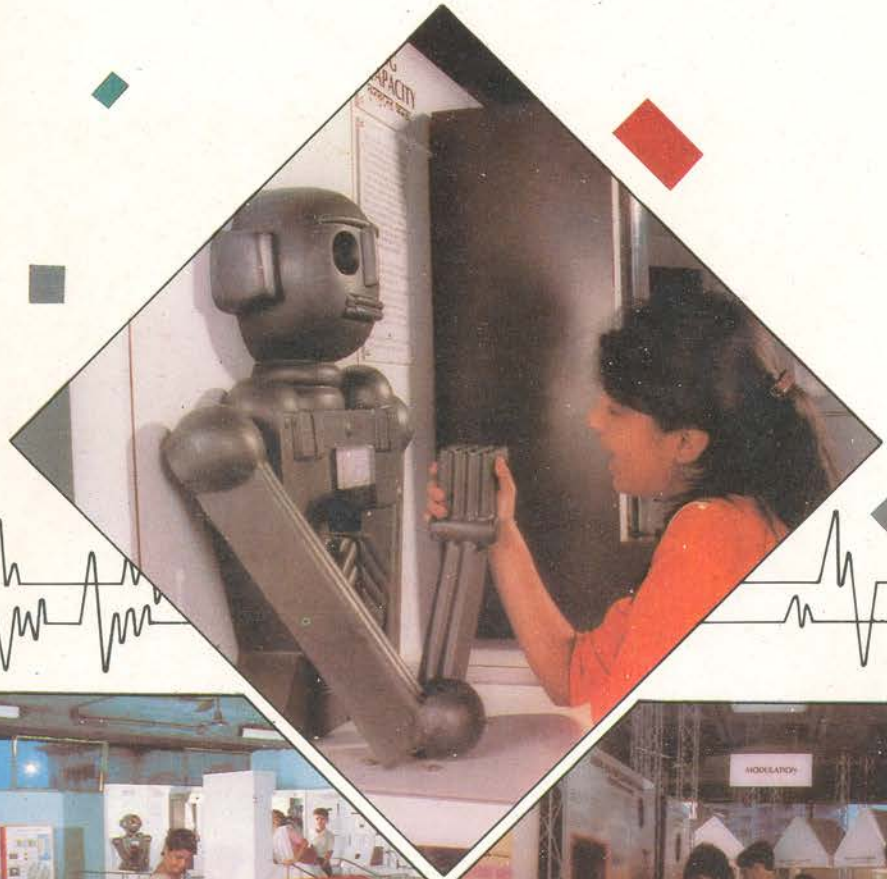
The exhibits in this gallery depict various underlying principles of electronics, its fascinating behaviour, and applications in different fields of science and technology. The gallery contains about 90 exhibits most of which are hands-on. One of the special features of this gallery is that most of the principles of electronics have been explained through a number of analogies which people are either acquainted with or experience everyday. Rectification, Amplification, Oscillation, Semiconductor, Digital electronics, Micro-electronics, Medical electronics, Computer and Robotics form some of the sections in this gallery.

The gallery begins with a multi-media presentation of the 'History of electronics' which attempts to depict chronological development of electronics right from the discovery of electron.



RECTIFICATION :

In the exhibit **'Diode–the Rectifier',** one is able to manipulate the arrangement of Diodes so that they could be connected as half, full or bridge wave rectifiers and will be able to study the pattern of change in output for each connection. While experimenting, at each stage, one will have the opportunity to verify the factors and thereby reach a firm conclusion with reasons. A side by side water analogy, with hydraulic valves substituting the 'Diode', makes the concept amply clear in **'One Way Flow'.**

A corner in this section has specially been devoted for children to highlight the fun-element in Electronics. Visitors can play with exhibits for detecting light, testing one's complexion, trying a hand in electronic burglary or running a radio without a battery.

AMPLIFICATION :

Clap before the **'Funny Tree'** and find that the lights blossom instead of flowers. Isn't it funny ? But curious visitors will have lot more to explore in this exhibit than mere fun. Interacting with common devices like slide projector for **Optical Magnification, Pantograph** for mechanical enlargement and transformer for electrical amplification will certainly help visitors to understand the function of electronic amplifiers.

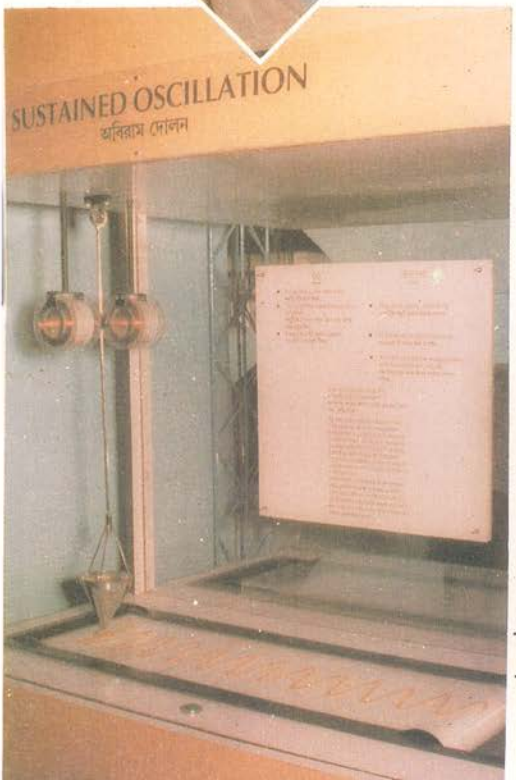
Operational Amplifier, popularly called 'OP Amp', is the basic building block of a world of gadgets like **Differentiator, Integrator, Adder** to name only a few. For visitors in this section, they are there—ready to be explored by participation.

Inductors and capacitors are known as the reservoirs of electrical energy. On the exhibit **'Oscillation That Decays',** one can charge up a capacitor and allow it to discharge through a resistance to produce what is known as oscillation. Curious visitors will have the opportunity to verify the role of capacitors and resistors in damping.

How oscillation builds up is a common question in the minds of many. Feedback is often said to be the reason. Still the question that persists in one's mind is How ? The exhibit **'How An Oscillator Works'** explains what exactly goes on inside the system before it developes sustained oscillation. One can speak into the microphone and see how gradually oscillation builds up. If one wants still more information, one can lift the telephone hand-set and can listen to explanations in detail.

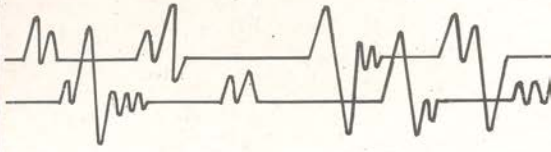
OSCILLATION :

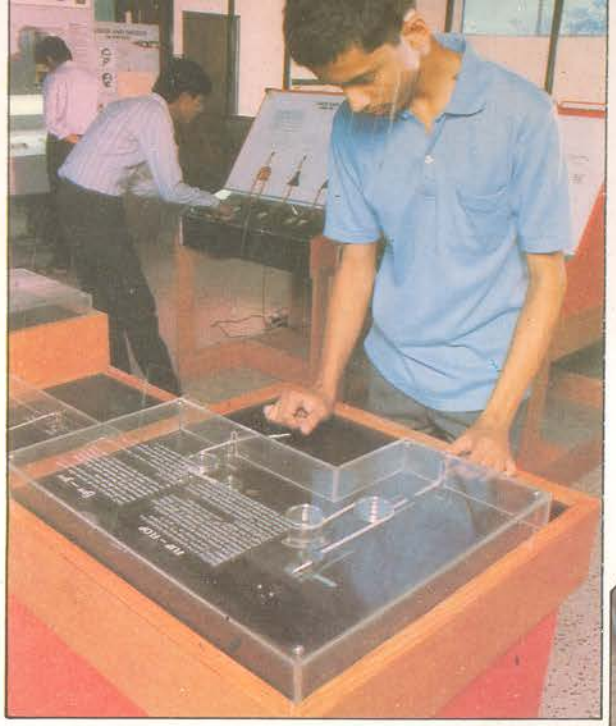
A major portion of this section has been devoted to exhibits connected with low frequency oscillations, i.e., oscillation that one often encounters and experiences in daily life. Visitors will have the opportunity to manipulate different parameters in exhibits and create different types of oscillations. Exhibits like **'Forced Oscillations', Reflection of Waves, Oscillations that we can See** may be quite interesting.

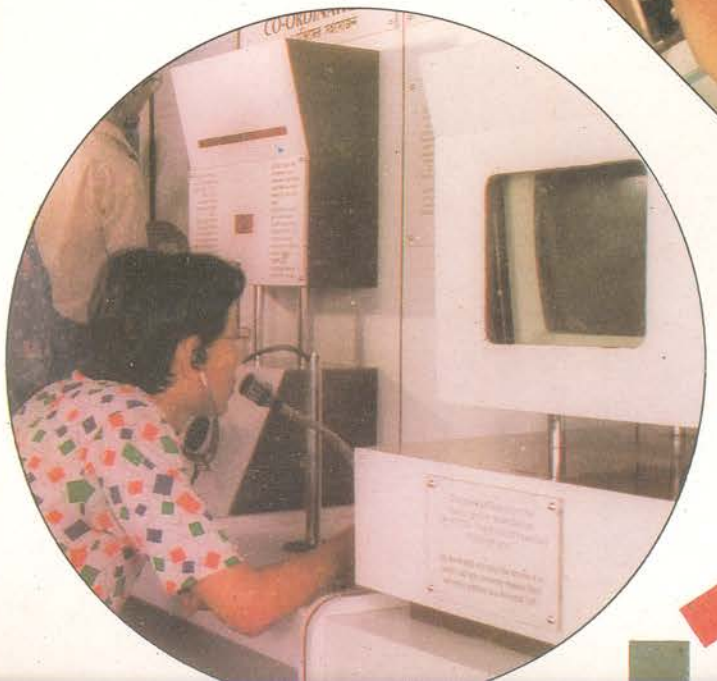


MODULATION :

If one tries to send signals from one place to another, one may end up with loss of intelligence, as the signals travel through the wire. To overcome this, one of the techniques that is employed is Modulation. Amplitude, Frequency, Pulse width and Pulse position are some of the parameters of modulation used in communication. An exhibit titled – **'Frequency Modulation'** will expose one to the subject through an interesting mechanical analogy. One will be able to vary the modulating signal and observe the pattern of the modulated signal drawn with sand on the conveyor. Another exhibit explains modulation in an experimental set up where the curious visitors can watch on the screen and verify the relationship between the carrier, modulated and modulating signals in real time.






COORDINATION

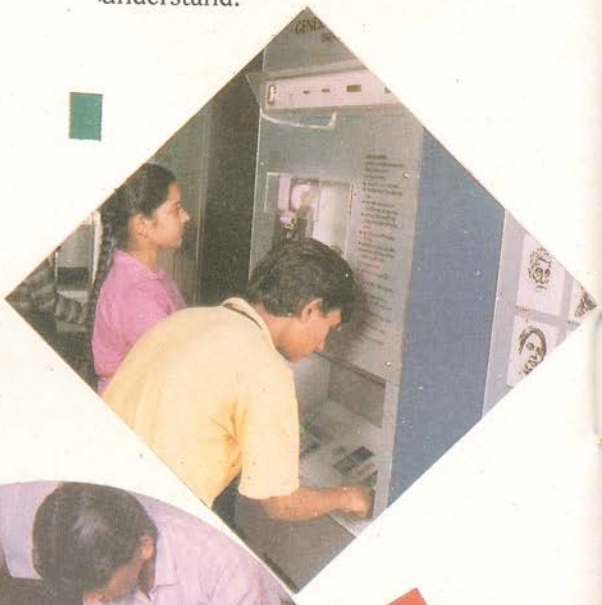

READ YOUR PULSE

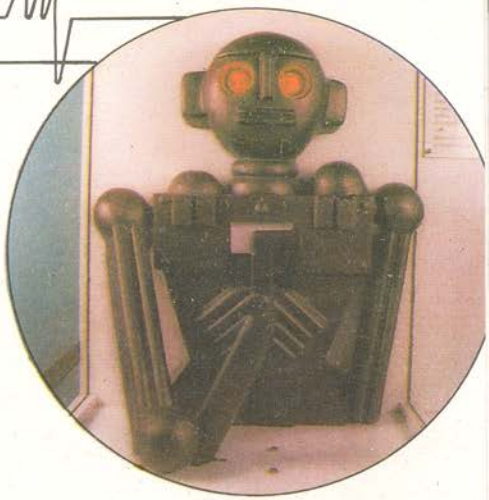
DIGITAL ELECTRONICS :

If computer is the end, Digital Electronics is the means. But if Digital Electronics is the end, then Gates like NOT – AND – OR are the means – the building blocks – the stepping stones. Yes, the visitors can see and verify that for themselves, for sure, in this section. But then there is a lot more. Starting with Binary Numbers (the basic tool for mathematical computation), the exhibits, one after another will unfold the mystery of what goes on inside a computer.

MICRO ELECTRONICS :

96% of earth's crust is made up of sand. It is a common experience that many of the items, one uses everyday, are made up of sand. But how many people really know that sand is the basic material in preparation of I.C.s and microprocessors, advent of which have changed the whole scenario of electronics ! Though the process by which ordinary sand is converted into semiconductor is very intricate, it is very interesting at the same time. In this section the story of how an I.C. is made from sand has been portrayed through a number of interesting demonstrative exhibits. One will have the rare opportunity of seeing **'What is inside an I.C.'.** A number of audio/ audio-visual aids will help one to understand the contents of exhibits which are too intricate to understand.





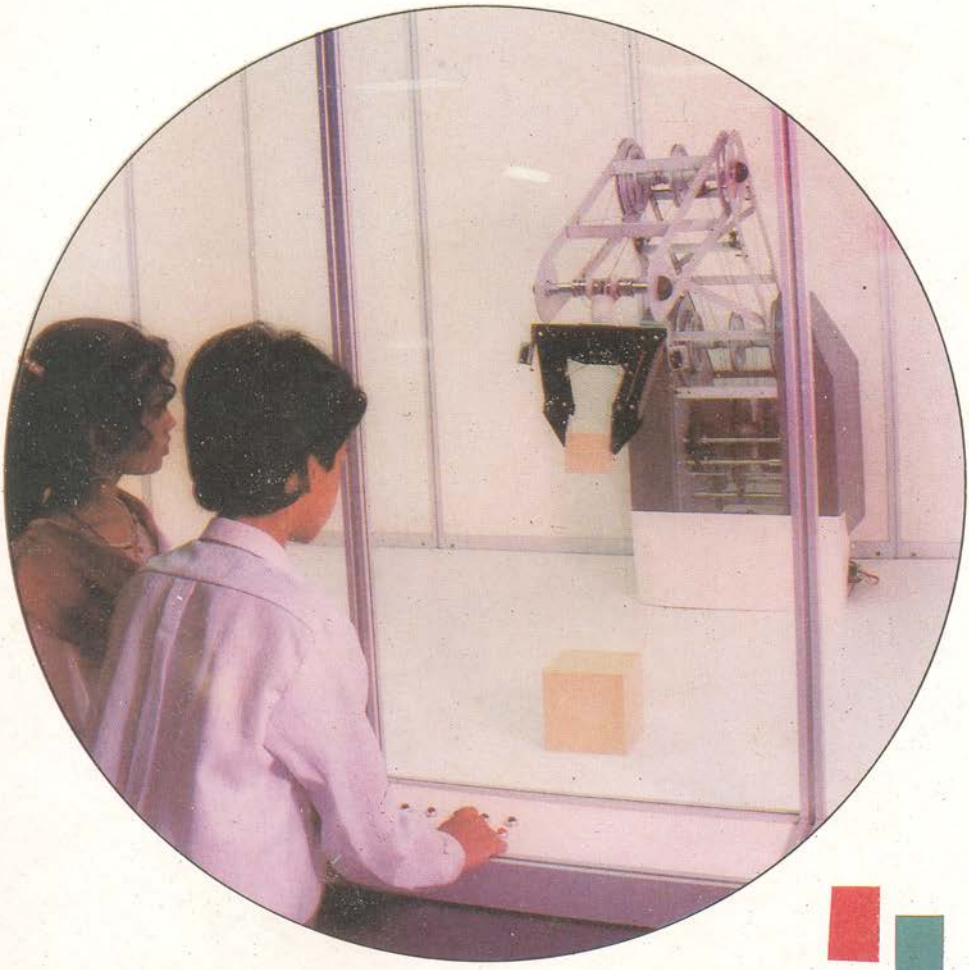
MEDICAL ELECTRONICS :

Advantages of using electronics in monitoring and interpreting basic parameters of our body, is a great contribution of this branch of science. Visitors will have the opportunity to measure blood pressure, pulse beat or lung capacity while playing with exhibits in this section. At **'Dr Know's Clinic'** one will be able to learn and update one's knowledge about the functions of different vital organs of human body.

A smoker stands to gain a lot from the clinic. The computer will try to collect relevant information from the visitors in an interactive mode of question-answer. It will finally give a number of suggestions which might be very useful in maintaining a good health.

Robot :

Visitors will have the unique opportunity of handling and watching man's intelligent servant called **'Robot'** who performs a variety of tasks on command from his master. In an exhibit one will have the thrilling experience of controlling a large 'Robotic Arm' for placing a few objects, one above another. By interacting with this machine one will learn the difficulty of man-machine interface. Side by side visitors will see how effortlessly a 'Robot' connected to a computer picks and places, certain blocks amongst many, to assemble a given 'name'. This will help the visitors to understand how a machine-machine interface works flawlessly.



GENERAL INFORMATION ABOUT THE MUSEUM

Galleries :

Atom, Motive Power, Transport, Iron and Steel, Copper, Petroleum, Mining, Popular Science, Electricity, Television, Communication, Computer Section, How Things Work, Children's Gallery and Electronics.

Museum Hours :

10 a.m. to 5.30 p.m. Open everyday except Mondays, Doljatra and Kalipuja.

Entrance :

Museum—Rs. 2/- per head,
Mock-up Coal Mine—Re. 1/- per head.
Free for organized student groups.

Special Attraction :

Underground Mock-up Coal Mine, Rabbit House, Snake Pits,Aquarium, Aviary, Bonsai and Cacti Garden.

Television and Scientific Film Shows every day.