ELECTRONICS AND INSTRUMENTATION ENGINEERS ASSOCIATION

MUTHAYAMMAL ENGINEERING COLLEGE

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INSTRONICS

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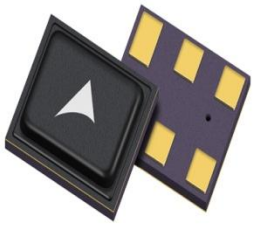
ANNIVERSARY



MEMS

SENSORS

LIFE STUDY

PRODUCTS

YEAR: 2010 ISSUE: 1 VOL: 6 SEP

EDITORS:

The Editors and Publishers of this magazine do their best to verify the information published, but do not take responsibility for the absolute accuracy of the information.

Your commends are welcomed and you can send your and newsletters through email to the mail-ID **instronicsmagazine@gmail.com.**

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"Our life is what our thought makes of it
Great thought comes from the heart"

We thank Our Honorable Management and Our Beloved Principal for their valuable guidance and encouragement in bringing up this magazine ***"INSTRONICS"*** *successfully celebrates its* ***1st Anniversary****.*

- EIE ASSOCIATION

SUCCESS AND HAPPINESS - THE NEED OF THE HOUR IN ONE'S LIFE TO BRING PROSPERITY:

One should remember in life that "everyone who is successful is not happy always and everyone who is happy all the time is not successful in all occasions".

A person who had participated for the first time in the Olympic Games and came last in the event might be happier than a person who came 2nd in the event and got silver medal. Because, the second person would be worrying a lot that he could not win the event with gold medal and whereas the first athlete would be happier that he was able to represent his country and participate successfully in the event.

We have to understand that happiness is always relative feelings. The thing that brings happiness to someone may not give the same to somebody else also.

Everyone enjoys the feelings of success and happiness only for few moments. It is always momentary, comes and goes and never stays permanent at one person or at one place. That's why, a person who has got world record or guinness record for the first time, never gets satisfied with that sets new records and wishes to have persistent success and happiness.

So, in life one should learn the art & secrets of converting ones failures & worries in to success and derive happiness in it which ultimately leads to prosperity in life. The most important thing in one's life is the ways & means one adopts to get success. The happiness comes by realizing all the dedicated efforts spent in achieving the success in the given assignment.

For instance, a physically disabled person who climbed the Mount Everest with no one's support would boast of his success to everyone and would derive the happiness every moment he thinks about all the efforts he had spent in climbing the mountain. Even after so many years of his achievement, he can feel the success and happiness every time he thinks about all his dedicated efforts spent in climbing the Everest. Till his death he can have those moments live in his memories and derive happiness.

Likewise, if a person gets a crore of rupees in a lottery and another person gets a crore of unexpected profits in his business, the second person will have long lasting happiness and the enjoyment will be more in this case as the efforts spent in the business is more unlike no efforts in winning the lottery.

When we compare the success and happiness of both individuals in amazing a wealth of one crore, the businessman will have more happiness which he can enjoy it every time he thinks about his efforts spent and he can make the success to repeat and can share and celebrate his happiness.

Though both of them were successful in amazing a wealth of one crore rupees, the degree of happiness definitely varies from person to person which is directly linked to the efforts one puts in achieving it. So, in life we should learn to put ones dedicated, committed and sincere efforts and enjoy the success & happiness of the efforts we have put in and do not bother about the outcome.

Success & failure is again a relative terminology. In life everyone cannot get success and everybody cannot avoid failures. It is their efforts and methodology adopted to win over makes the difference.

To get more prosperity in our business and in our life, let us concentrate and focus on our efforts, processes, methods, strategies adopted to achieve the goals. Success & Happiness definitely follow automatically. As the saying of Bagawat Geetha goes "put all your dedicated and committed efforts in achieving the goals and leave the rest to the divine, you will reap the success positively".

By:

Prof.K.Elamvazhuthi,

Professor of Management.

UNIT CONVERSIONS:

1) PRESSURE UNITS:

Unit	Equivalent Measurements
Atmosphere (atm)	1 atm = **14.6956 psi.** 1 atm = **101,325 Pascals.** 1 atm = **760 torr.** 1 atm = **760 mm Hg.** *Normal atmospheric pressure is defined* **as 1 atmosphere.**
Torr (torr)	1 atm = **760 torr.** 1 atm = 14.7 **psi.**
Bar (bar)	1 bar = **750.062 torr.** 1 bar = **0.9869 atm.** 1 bar = **100,000 Pa.**
Pascal (Pa)	1 pascal = **10 dyne/cm^2**. 1 pascal = **0.01 mbar.** 100 kPa = **1 bar.** 100 kPa **= 750 torr**. 1 megapascal = **1,000 kPa**. 1 megapascal = **9.869 atm.** 1 megapascal = **145 psi**. 1 pascal = **a force of 1 Newton per square meter.** *(1 Newton = the force required to accelerate 1 kilogram one meter per second per second = 1 kg·m/s^2)*

2) TEMPERATURE UNITS:

Celsius (centigrade):

	from Celsius
Fahrenheit	[°F] = [°C] × $^{9}/_{5}$ + 32
Kelvin	[K] = [°C] + 273.15
Rankine	[°R] = ([°C] + 273.15) × $^{9}/_{5}$
Delisle	[°De] = (100 − [°C]) × $^{3}/_{2}$
Newton	[°N] = [°C] × $^{33}/_{100}$
Réaumur	[°Ré] = [°C] × $^{4}/_{5}$
Rømer	[°Rø] = [°C] × $^{21}/_{40}$ + 7.5

Fahrenheit:

	from Fahrenheit
Celsius	[°C] = ([°F] − 32) × $^{5}/_{9}$
Kelvin	[K] = ([°F] + 459.67) × $^{5}/_{9}$
Rankine	[°R] = [°F] + 459.67
Delisle	[°De] = (212 − [°F]) × $^{5}/_{6}$
Newton	[°N] = ([°F] − 32) × $^{11}/_{60}$
Réaumur	[°Ré] = ([°F] − 32) × $^{4}/_{9}$
Rømer	[°Rø] = ([°F] − 32) × $^{7}/_{24}$ + 7.5

Delisle:

	from Delisle
Celsius	[°C] = 100 − [°De] × $^{2}/_{3}$
Fahrenheit	[°F] = 212 − [°De] × $^{6}/_{5}$
Kelvin	[K] = 373.15 − [°De] × $^{2}/_{3}$
Rankine	[°R] = 671.67 − [°De] × $^{6}/_{5}$
Newton	[°N] = 33 − [°De] × $^{11}/_{50}$
Réaumur	[°Ré] = 80 − [°De] × $^{8}/_{15}$
Rømer	[°Rø] = 60 − [°De] × $^{7}/_{20}$

Newton:

	from Newton
Celsius	[°C] = [°N] × $^{100}/_{33}$
Fahrenheit	[°F] = [°N] × $^{60}/_{11}$ + 32
Kelvin	[K] = [°N] × $^{100}/_{33}$ + 273.15
Rankine	[°R] = [°N] × $^{60}/_{11}$ + 491.67
Delisle	[°De] = (33 − [°N]) × $^{50}/_{11}$
Réaumur	[°Ré] = [°N] × $^{80}/_{33}$
Rømer	[°Rø] = [°N] × $^{35}/_{22}$ + 7.5

Réaumur:

	from Réaumur
Celsius	[°C] = [°Ré] × $^{5}/_{4}$
Fahrenheit	[°F] = [°Ré] × $^{9}/_{4}$ + 32
Kelvin	[K] = [°Ré] × $^{5}/_{4}$ + 273.15
Rankine	[°R] = [°Ré] × $^{9}/_{4}$ + 491.67
Delisle	[°De] = (80 − [°Ré]) × $^{15}/_{8}$
Newton	[°N] = [°Ré] × $^{33}/_{80}$
Rømer	[°Rø] = [°Ré] × $^{21}/_{32}$ + 7.5

Rømer:

	from Rømer
Celsius	[°C] = ([°Rø] − 7.5) × $^{40}/_{21}$
Fahrenheit	[°F] = ([°Rø] − 7.5) × $^{24}/_{7}$ + 32
Kelvin	[K] = ([°Rø] − 7.5) × $^{40}/_{21}$ + 273.15
Rankine	[°R] = ([°Rø] − 7.5) × $^{24}/_{7}$ + 491.67
Delisle	[°De] = (60 − [°Rø]) × $^{20}/_{7}$
Newton	[°N] = ([°Rø] − 7.5) × $^{22}/_{35}$
Réaumur	[°Ré] = ([°Rø] − 7.5) × $^{32}/_{21}$

Kelvin:

	from Kelvin
Celsius	[°C] = [K] − 273.15
Fahrenheit	[°F] = [K] × $^{9}/_{5}$ − 459.67
Rankine	[°R] = [K] × $^{9}/_{5}$
Delisle	[°De] = (373.15 − [K]) × $^{3}/_{2}$
Newton	[°N] = ([K] − 273.15) × $^{33}/_{100}$
Réaumur	[°Ré] = ([K] − 273.15) × $^{4}/_{5}$
Rømer	[°Rø] = ([K] − 273.15) × $^{21}/_{40}$ + 7.5

Rankine:

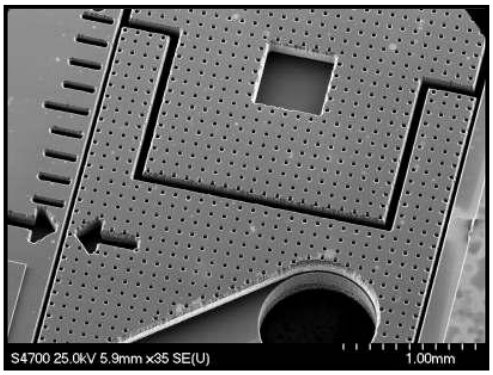
	from Rankine
Celsius	[°C] = ([°R] − 491.67) × $^{5}/_{9}$
Fahrenheit	[°F] = [°R] − 459.67
Kelvin	[K] = [°R] × $^{5}/_{9}$
Delisle	[°De] = (671.67 − [°R]) × $^{5}/_{6}$
Newton	[°N] = ([°R] − 491.67) × $^{11}/_{60}$
Réaumur	[°Ré] = ([°R] − 491.67) × $^{4}/_{9}$
Rømer	[°Rø] = ([°R] − 491.67) × $^{7}/_{24}$ + 7.5

By:

Mr.K.T.M.Sachin,
Final year (MEIEA).

MEMS:

Micro-Electro-Mechanical Systems (MEMS) is the integration of mechanical elements, sensors, actuators, and electronics on a common silicon substrate through micro fabrication technology. While the electronics are fabricated using integrated circuit (IC) process sequences (e.g., CMOS, Bipolar, or BICMOS processes), the micromechanical components are fabricated using compatible "micromachining" processes that selectively etch away parts of the silicon wafer or add new structural layers to form the mechanical and electromechanical devices.



MEMS promises to revolutionize nearly every product category by bringing together silicon-based microelectronics with micromachining technology, making possible the realization of complete **systems-on-a-chip**. MEMS is an enabling technology allowing the development of smart products, augmenting the computational ability of microelectronics with the perception and control capabilities of microsensors and microactuators and expanding the space of possible designs and applications. Microelectronic integrated circuits can be thought of as the "brains" of a system and MEMS augments this decision-making capability with "eyes" and "arms", to allow microsystems to sense and control the environment. Sensors gather information from the environment through measuring mechanical, thermal, biological, chemical, optical, and magnetic phenomena.

The electronics then process the information derived from the sensors and through some decision making capability direct the actuators to respond by moving, positioning, regulating, pumping, and filtering, thereby controlling the environment for some desired outcome or purpose. Because MEMS devices are manufactured using batch fabrication techniques similar to those used for integrated circuits, unprecedented levels of functionality, reliability, and sophistication can be placed on a small silicon chip at a relatively low cost.

MEMS and Nano devices are extremely small - for example, MEMS and Nanotechnology has made possible electrically-driven motors smaller than the diameter of a human hair (right) - but MEMS and Nanotechnology is not primarily about size.

MEMS and Nanotechnology is also not about making things out of silicon, even though silicon possesses excellent materials properties, which make it an attractive choice for many high-performance mechanical applications; for example, the strength-to-weight ratio for silicon is higher than many other engineering materials which allows very high-bandwidth mechanical devices to be realized.

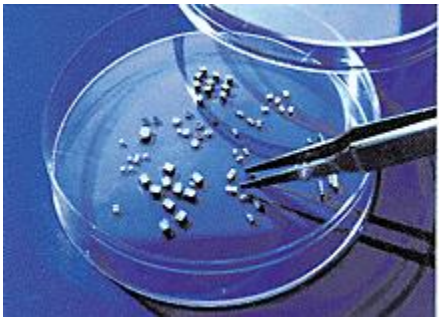
Instead, the deep insight of MEMS and Nano is as a new manufacturing technology, a way of

making complex electromechanical systems using batch fabrication techniques similar to those used for integrated circuits, and uniting these electromechanical elements together with electronics.

Advantages of MEMS and Nano Manufacturing:

First, MEMS and Nanotechnology are extremely diverse technologies that could significantly affect every category of commercial and military product. MEMS and Nanotechnology are already used for tasks ranging from in-dwelling blood pressure monitoring to active suspension systems for automobiles.

The nature of MEMS and Nanotechnology and its diversity of useful applications make it potentially a far more pervasive technology than even integrated circuit microchips.



Second, MEMS and Nanotechnology blurs the distinction between complex mechanical systems and integrated circuit electronics. Historically, sensors and actuators are the most costly and unreliable part of a macroscale sensor-actuator-electronics system.

MEMS and Nanotechnology allows these complex electromechanical systems to be manufactured using batch fabrication techniques, decreasing the cost and increasing the reliability of the sensors and actuators to equal those of integrated circuits.

Yet, even though the performance of MEMS and Nano devices is expected to be superior to macroscale components and systems, the price is predicted to be much lower.

APPLICATIONS:

There are numerous possible applications for MEMS and Nanotechnology. As a breakthrough technology, allowing unparalleled synergy between previously unrelated fields such as biology and microelectronics, many new MEMS and Nanotechnology applications will emerge, expanding beyond that which is currently identified or known.

Here are a few applications of current interest:

1) Biotechnology:

MEMS and Nanotechnology is enabling new discoveries in science and engineering such as the

1) Polymerase Chain Reaction (**PCR**) Microsystems for DNA amplification and identification.

2) Micromachined Scanning Tunneling Microscopes (**STMs**), biochips for detection of hazardous chemical and biological agents.

3) Microsystems for high-throughput drug screening and selection.

2) Communications:

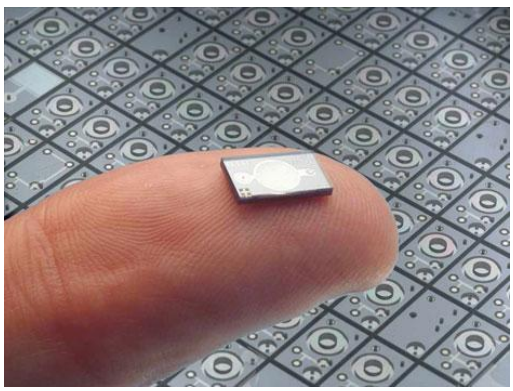
High frequency circuits will benefit considerably from the advent of the RF-MEMS technology. Electrical components such as **Inductors** and

tunable capacitors can be improved significantly compared to their integrated counterparts if they are made using MEMS and Nanotechnology. With the integration of such components, the performance of communication circuits will improve, while the total circuit area, power consumption and cost will be reduced. In addition, the **Mechanical Switch**, as developed by several research groups, is a key component with huge potential in various microwave circuits. The demonstrated samples of mechanical switches have quality factors much higher than anything previously available.

Reliability and packaging of **RF-MEMS** components seem to be the two critical issues that need to be solved before they receive wider acceptance by the market.

3)Accelerometers:

MEMS accelerometers are quickly replacing conventional accelerometers for crash air-bag deployment systems in automobiles. The conventional approach uses several bulky accelerometers made of discrete components mounted in the front of the car with separate electronics near the air-bag; this approach costs over $50 per automobile.



MEMS and Nanotechnology has made it possible to integrate the accelerometer and electronics onto a single silicon chip at a cost between $5 to $10. These MEMS accelerometers are much **smaller, more functional, lighter, more reliable,** and are produced for a fraction of the cost of the conventional macro-scale accelerometer elements.

CHALLENGES:

Limited Options:

Most companies who wish to explore the potential of MEMS and Nanotechnology have very limited options for prototyping or manufacturing devices, and have no capability or expertise in micro fabrication technology. Few companies will build their own fabrication facilities because of the high cost. A mechanism giving smaller organizations responsive and affordable access to MEMS and Nano fabrication is essential.

Packaging:

The packaging of MEMS devices and systems needs to improve considerably from its current primitive state. MEMS packaging is more challenging than IC packaging due to the diversity of MEMS devices and the requirement that many of these devices be in contact with their environment.

Currently almost all MEMS and Nano development efforts must develop a new and specialized package for each new device. Most companies find that packaging is the single most expensive and time consuming task in their overall product development program. As for the components themselves, numerical modeling and

simulation tools for MEMS packaging are virtually non-existent.

Approaches which allow designers to select from a catalog of existing standardized packages for a new MEMS device without compromising performance would be beneficial.

Fabrication Knowledge Required:

Currently the designer of a MEMS device requires a high level of fabrication knowledge in order to create a successful design. Often the development of even the most mundane MEMS device requires a dedicated research effort to find a suitable process sequence for fabricating it. MEMS device design needs to be separated from the complexities of the process sequence.

MEMS Forums

MEMS-talk

The MEMS-talk mailing list is for the exchange of MEMS related information, views, and general discussion. It is also intended to build a freely accessible body of MEMS knowledge via the MEMS-talk archive.

The list is sponsored by the MEMS Exchange as a service to the MEMS community, and is a continuation of the MEMS mailing list originally hosted by ISI. Before asking the list a question, be sure to check the MEMS-talk archive and try searching on Google. The archives can also be searched from MEMS net.org's search page.

MEMS-business

The MEMS-Business mailing list is for discussion relating to the business side of MEMS technology. Possible topics might include:

- Finding and comparing vendors of MEMS-related equipment, supplies and services.
- Discussions from MEMS-talk that devolve into recommendations for commercial MEMS entities.
- Notices of used equipment or surplus supplies being privately sold by an individual or institution.
- General discussion of MEMS companies or the MEMS marketplace.

Before asking the list a question, be sure to check the MEMSnet vendor list and try searching on Google. The list archives can also be searched from MEMSnet.org's search page.

MEMS-announce

The MEMS-announce list is a service provided by MEMSnet.org and hosted by the MEMS Exchange. It is a low-volume; moderated announcement list. Job opportunities and event listings posted on www.memsnet.org will also be sent to MEMS-announce. Announcements or press releases that don't qualify as news, job or event postings on memsnet.org can and should be sent directly to MEMS-announce.

By:

Dr.M.Madheswaran,
Principal.

SCOPES & OPPORTUNITY'S FOR INSTRUMENTATION ENGINEERING

Electronics and Instrumentation engineers have very good scope. They have wide range of fields where they can seek employment.

The Openings in Electric power generating stations, Process Industries, Automation Industries, Manufacturing companies, Infrastructure projects, Computer software & Hardware etc were the scopes and job opportunity exist. In fact everywhere the instruments are used also entire instrumentation systems considered being the eyes and ears of the industries.

The Electronic Engineer is part of Electrical Engineering study with emphasis on Electronic, while Instrument Engineering is the practical part of electrical and electronic practice and where numerous profession are available rather than academic, like Control engineer, Automation Engineer, Calibration and design engineer. Also it is an integrated disciplinary course as it has the combined scopes from CSE, EEE, ECE, ICE, CHEMICAL ENGG, and BME apart from its own scopes.

WHAT IS INSTRUMENTATION ENGINEERING?

Instrumentation is a branch of engineering which deals with measurement of various physical quantities like temperature, pressure, level, flow, speed, sound, light intensity and control of the same in various industries.

Instrumentation system is widely used in industries viz. automobile, pharmaceuticals, chemical, fertilizers, power plants, pollution control, biomedical, food processing, electronic product manufacturing, and textile.

Instrumentation engineering is also defined as the engineering focused on the principle and operation of measuring instruments which are used in design and configuration of automated systems in electrical, pneumatic domains etc.

They typically work for industries with *automated processes*, such as **chemical** or **manufacturing plants**, with the goal of improving system productivity, reliability, safety, optimization and stability. To control the parameters in a process or in a particular system.

The automation systems in the production are rapidly being enhanced and the demand for highly skilled instrumentation engineers is on the rise.

In the instrumentation systems manufacturing sector, the demand for well trained process control engineering graduates is always present. This course provides more employment even in the IT sectors and its streams as Instrumentation students are with the sound theoretical &

practical training in the operation and design of electronic instruments, digital logic systems, and computer based automatic process control & instrumentation, & automatic control system design, etc.

To meet the industrial requirements of future, students are also made to become well versed with personal computer applications in Instrumentation, Process Control Systems Design, PLCs, DSP Architecture & Design, Microprocessors and Microcontroller System Design & Experimentation, Industrial Electronics & Applications. Instruments often comprise control systems of varied processes.

The control of processes is one of the main branches of applied instrumentation. Instrumentation plays a significant role in both gathering information from the field and changing the field parameters, and as such are a key part of control loops.

Instrumentation is subset of Electrical and electronics, where one is interested in converting real world information (pressure, temperature, etc) into digital information (serial data for example) and designing appropriate circuits to convert from analog to digital, with signal "conditioning" as necessary.

As an Instrumentation engineer one should learn signal **processing and manipulating** variables to get a certain desired result. It also related to get the term "**automation"**.

Generally, Instrumentation engineers find jobs in R&D units of public and private sector companies. Heavy industries such as thermal power stations, steel plants, refineries, cement and fertilizer plants need instrumentation engineers.

FOR JOBS:

www.engineers-international.com
www.controljobs.com
www.soe.uoguelph.ca
www.educationinfoindia.com
www.scribed jobes.com
www.oilcareers.com/content/categories/ Engineering_Instrumentation.asp

FOR EBOOKS:

www.ourinstrumentationgroup.com
www.gigapedia.com
www.freecomputerbooks.com
www.ieie.com

By:

Prof.M.Muruganandam,
Asst.Professor& HOD (EIE).

NET A JOB ONLINE:

Arm yourself with an impressive résumé and power your way to your dream job using the Net Looking for a job is never going to be the same. Gone are the days when the only hope of finding a job was poring through tiny classifieds of the newspaper day after day.

Gone are the days when all you could do was send a résumé to a company and hope to God that you'd get a call soon.

Gone are the days when you'd wait for months on end waiting for some placement agency to get back to you.

Welcome to the jet age of the net. With an electronic copy of your résumé, you're ready to make use of the immense power of the Net to get that job you've been dreaming about.

The Net has become the shortest and quickest way of bridging the gap between an employer and you. And it's just not e-mail that we're talking about. The Net opens doors that were otherwise closed to you, in ways that we wouldn't have imagined a little while ago. For instance, there are zillions of jobsites vying for your résumé. Then there are sites that dole out career advice. Or if you want to find what a particular company is like, check out its corporate Website, and the many other sites that have info on it. Or put up a really good résumé at any of the free Web pages.

But then searching for a job isn't all that easy. The net isn't a limited place that you can finish searching in a shot.

You also need to equip yourself with some things or you could just end up looking un-professional.

Let's explore what you need to know. Start with the résumé. Get to work-make an impressive résumé

E-MAIL RESUME:

When you send your résumé, you could either send it as an attachment (say a Word file) or as text within the e-mail message. With the first option, all the pretty formatting you've done remains. But remember most companies don't have the patience to go through fancy attachments, especially if they're huge.

Text résumés are safe, but that means you can't get into fancy formats. You can post them to résumé databases, newsgroups and mailing lists

KEEP THESE POINTS IN MIND WHEN YOU MAKE A TEXT RESUME:

- ✓ Don't have more than 70 characters per line.
- ✓ You can't have tabs, boldface or italic fonts. Make use of these instead.
- ✓ Use asterisk (*) or plus sign (+) at the beginning of lines instead of bullets.
- ✓ Use a series of dashes to separate sections.

Instead of bold text, you can consider changing the first letter to capitals.

Include keywords that best describe your job profile. Text résumés

are stored in résumé databases. A good résumé must be retrievable through keyword searches.

It should include keywords and phrases to describe your skills and areas of expertise such as ORACLE DBA, Technical writer, Marketing Manager with an MBA and so on.

Put up a résumé on your Web page. A Web résumé is similar to your traditional résumé. But it's published on your personal Website so that it's always available to potential employers. But the résumé has to be made accessible to others.

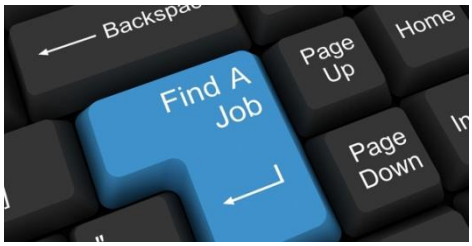
For this submit its URL address to various search engines such as Yahoo, Info seek or Lycos.

HERE ARE SOME POINTS TO KEEP IN MIND:

- Keep the personal web page separate from your professional web page.
- Use graphics sparingly and use only those that enhance your professional image.
- A good home page should capture the employer's interest and let him view the contents easily.
- Actively refer your Website to all professional contacts. Enclose your Internet address on your cover letter, visiting cards and e-mail address.

GET SET FOR THE HUNT:

Once you've made a neat résumé, the next step is to search for a job. **jobsahead.com** advises the job seekers to register with jobsites and go through the databases of every such site. Check out the databases of those sites first that offer free registration. Later you could register with those that ask for some registration fee.



You can shortlist the jobs according to your requirement and then apply for the same. The best places to search for job openings on the Internet are Internet Search Engines Yahoo, Lycos and Info seek are Web directories that index other Web pages. Once you've decided on your search tool, choose a specific way to phrase your search questions, usually referred to as a 'query' or 'search strategy'.

The majority of search tools support the queries that include 'Boolean operators'. These operators help you locate specific information on the Internet, be it the need to research companies' credentials, locate career sites or keep yourself updated about career related industry issues. See box for details on these.

Company Websites If you have a specific set of companies, then whittle down your list of potential companies and target them by visiting their Websites.

Review the job openings available by matching their needs with your particular skills and specialties.

Many companies let you apply online, and they often list the contact person for an easy follow up.

Contact HR executives by enclosing a cover letter and résumé. Specialized job Websites There're umpteen specialized job Websites providing free registration.

Job seekers can place their résumés in their databases accessed by employers. These sites also have a searchable jobs database that lists all the jobs put up there by employers. You can get to the job openings from the jobs databases using keyword searches. Use a good mix of keywords related to your area of specialization.

You can look for jobs according to location, experience, salary or other parameters. Newspaper classifieds all well-known newspapers have their commercial Websites. This helps individuals to access job listings at local, national and international levels. The site w**ww.careerpath.com's** an excellent job site for searching classified ads in the classified employment sections of over 30 newspapers.

Similar Indian sites are **www.ads2book.com** and you can also use the site **www.newspapers.com** to reach newspapers of any country of your choice and look for job openings. Newsgroups Also known as Usenet are the global networks of electronic discussion forums where one can discuss any subject. Employers too, post their job openings in newsgroups.

You can access these newsgroups through any commercial Web browser and use them to post your résumé to build contacts to help you in job search.

Manage your job search Understanding the huge amount of information available on the Net is an ongoing learning process.

By focusing on your job search goals and being organized, you can keep track of the positions applied for, the companies that you need to follow up with or search new Websites where you can link or post your résumé.

TRACKING TIPS:

Customize your résumé for the Internet by using proper format to prevent it from becoming garbled. Keep it ready to print or e-mail on demand. Keep record of your research and maintain key information in the form of bookmark files, text files or paper files as you explore career online or potential employers' Websites.

Enroll with online career Websites through a valid username and password and note them down for future references. Also, post your résumé in résumé databases according to your area of specialization.

Participate in Newsgroups' discussions to build contacts, which can help you with your job search.

Search newsgroups, job-search databases, company Websites or newspaper classifieds for new job

openings by using efficient keywords, especially while searching through databases.

Set realistic goals to remain focused. State it in quantifiable terms like "I'm going to spend the next hour looking for two potential employers who need someone with Java Programming Skills or Technical writing skills in the US or Marketing Manager Position in Airline Industry", and more.

Finalize your potential employers. Once that's done, begin with employer research at the company's Website Read information under the sub-heads Mission Statements, Services, Annual Report or Strategic Plan. This'll help you see how the organization describes itself.

Never forget to check out for career opportunities or human resource area, as one can get worthy job opening, not posted online. Follow up with companies and recruiters. Stay ahead of the obsolescence curve.

To compete, stay on top of job boards and respond to ads early. Keep abreast with the latest developments in industry and the trends.

PROTECT YOUR PRIVACY:

Searching the Net for a job has its shortcomings too. You may come across some ads that may lure you by false promises or fake job-offerings.

The other concern is 'how much is too much', as far as privacy and confidentiality of information are concerned.

You may be happily employed at your current job and want to keep an eye out for the dream job by being a passive jobseeker. But watch out.

Your résumé is put into résumé databases and can even be accessed by your current employer! So, if possible, choose a jobsite that sends employer enquiries to you by e-mail and lets you decide whether you want that employer to view your résumé.

Several job sites limit the amount of contact information that a potential employer can see. Some sites even leave your résumé out of their résumé database if you request. Before placing your résumé or other information on the site, look for its privacy policy.

PERSEVERANCE IS THE KEY TO SUCCESS

It's just possible that your application for a job finds no response. It's because your résumé is passed on from employment services to the employers without any acknowledgement sent back to you. In all the cases it's solely the employer's decision as to respond or not.

Many employers receive so many résumés that they don't respond to all of them. So, don't panics, finding a job on the Net is often a long process and doesn't replace conventional job-hunting methods. At the same time, a job seeker not using the Net is probably missing out on many golden opportunities.

By:

S.V.Vijaya Raj,
Alumni (MEIEA).

COMPANY:

Digiqualsystems

ADDRESS:

144, Easwaran Koil Street,
Madipakkam,Chennai,
Tamil Nadu – 600091,
044 2258 2122,
09444346180.

CATEGORIES:

Heaters - Industrial,
Heating Equipment Supplier,
Thermocouple,
Electric Industrial Heaters,
Process Control instrumentation.

WEB ADDRES: digiqualsystems.com

Frehnig Instruments and Controls

ADDERESS:

47, TEXTOOL
BALASUNDARAM STREET,
COIMBATORE,
Tamil Nadu 641006
0422 2567747

CATEGORIES:

Process Control Instruments.
Electromagnetic Flow Meters.
suitable for measuring fluids like water,effluent,chilled water for BTU Meter .

EMAIL: info@frehnig.com
WEB ADDRES: frehnig.com

Genuine Machining Systems

ADDRESS:

Perianaickenpalayam, 48/3,
Ooty House, T.R.D. Nagar,
S.R.K.V. Post,
Coimbatore,
Tamil Nadu 641020
042 22696307
09843105040

CATEGORIES:

Safety Valves Manufacturers,
Fuel Solenoid Valve,
Manufacturer and supplier of industrial valves like safety valve, pilot operated valve, non return valve, oil stop valve, fuel solenoid valve etc.

EMAIL: gmscity_tn@yahoo.com
WEB ADDRES: indiamart.com

KEAS Control Systems India Private Limited

ADDERESS:

3rd Floor, Singapore plaza,
#333, Crosscut Road,
Gandhipuram, Coimbatore,
Tamil Nadu 641012
0422 429 7601

CATEGORIES:

Industries in core sectors like Oil & Gas, Power, Sugar, Steel, Cement etc.

EMAIL: sales@keascontrols.com
WEB ADDRES:keascontrols.com

CAR - REVERSING HORN WITH FLASHER:

Here is a simple circuit that starts playing the car horn whenever your car is in reverse gear.

The circuit (refer Fig. 1) employs dual timer NE556 to generate the sound. One of the timers is wired as an astable multivibrator to generate the tone and the other is wired as a monostable multivibrator.

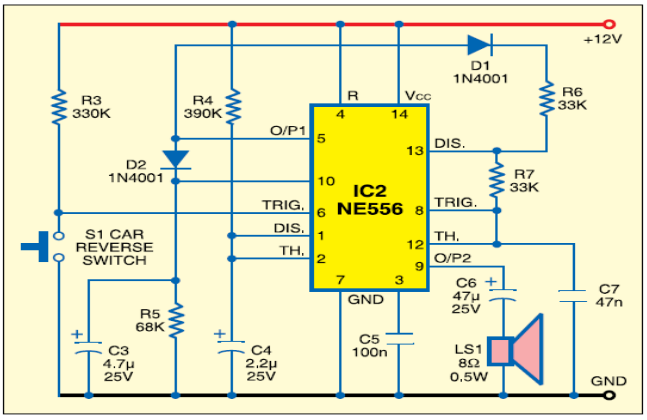


Fig. 1: *Car reverse horn*

When the junction of diodes D1 and D2 is low, the astable multivibrator is disabled to stop oscillating.

The output of the astable multivibrator is fed to the speaker through capacitor C6. The speaker, in turn, does not produce sound.

Connect the circuit to the car reverse switch through two wires such that S1 shorts when the car gear is reversed and is open otherwise.

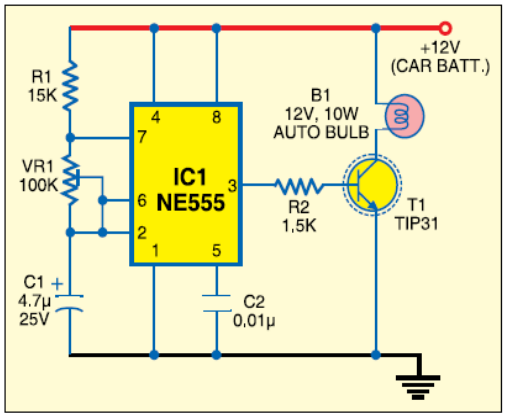


Fig. 2: *Flasher circuit*

Working of the circuit:

When the car is in reverse gear, reverse- gear switch S1 of the car gets shorted and the monostable timer triggers to give a high output.

As a result, the junction of diodes D1and D2 goes high for a few seconds depending on the time period developed through resistor R4 and capacitor C4. At this point, the astable multivibrator is enabled to start oscillating.

The output of the astable multivibrator is fed to the speaker through capacitor C6. The speaker, in turn, produces sound until the output of the monostable is high.

To power the circuit, use the car battery. The flasher circuit (shown in Fig. 2) is built around timer NE555, which is wired as an astable multivibrator that Outputs square wave at its pin 3.

A 10W auto bulb is used for flasher. The flashing Rate of the bulb is decided by preset VR1. The flasher bulb can be mounted at the car's rear side in a reflector or a narrow painted suitable enclosure.

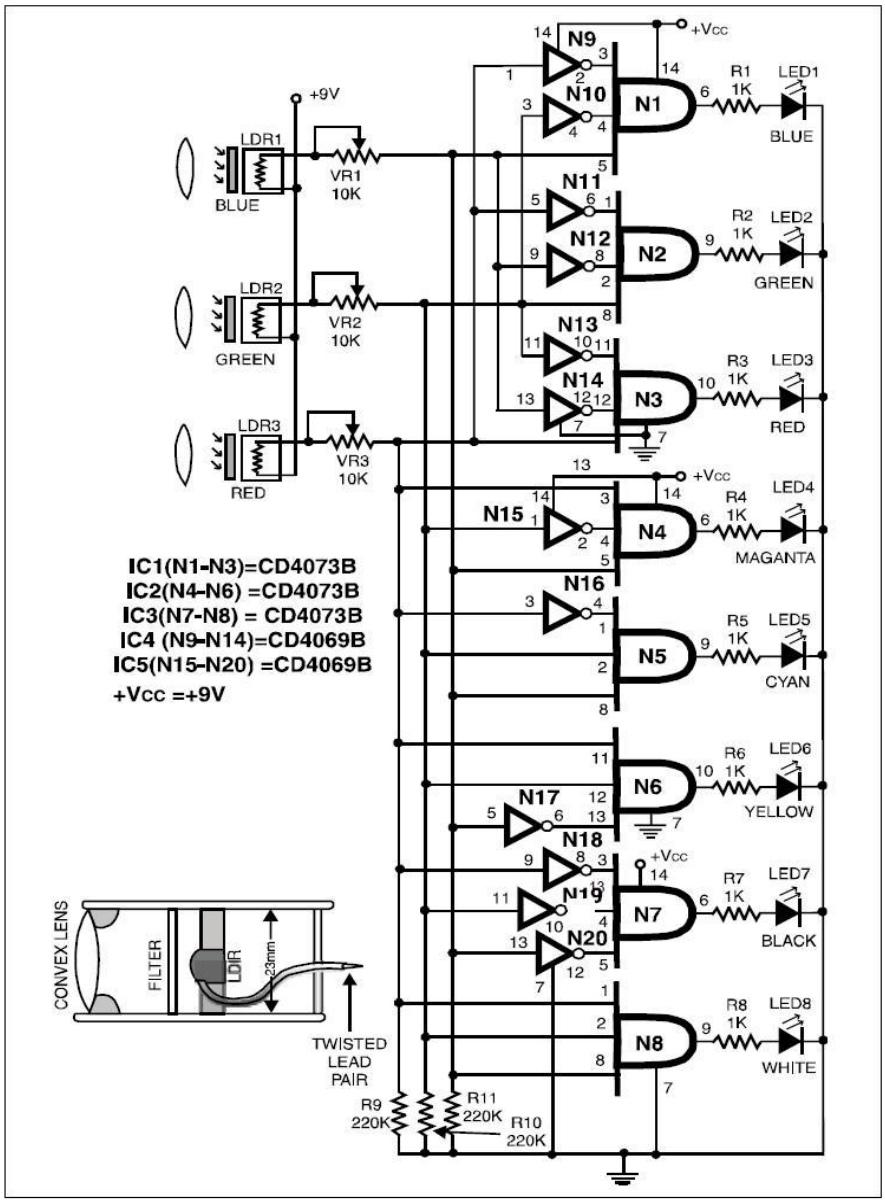
This circuit also help us to found that car is in neutral gear or reverse gear by simply listening the sound and the indication.

COLOUR SENSOR:

The circuit can sense eight colors, i.e. green and red, magenta, yellow and cyan and black and white. The circuit is based on the fundamentals of optics and digital electronics.

The convex lenses are used to converge light rays. This helps to increase the sensitivity of LDRs.

Blue, green and red glass plates (filters) are fixed in front of LDR1, LDR2 and LDR3 respectively.



The object whose color is the object whose color is required to be detected should be placed in front of the system. The light rays reflected from the object will fall on the three convex lenses which are fixed in front of the three LDRs.

When reflected light rays from the object fall on the gadget, the colored filter glass plates determine which of the LDRs would get triggered. The circuit makes use of only 'AND' gates and 'NOT' gates.

When a primary colored light ray falls on the system, the glass plate corresponding to that primary color will allow that specific light to pass through. But the other two glass plates will not allow any light to pass through. Thus only one LDR will get triggered and the gate output corresponding to that LDR will become logic 1 to indicate which Color it is.

Similarly, when a secondary colored light ray falls on the system, the two primary glass plates corresponding to the mixed color will allow that light to pass through while the remaining one will not allow any light ray to pass through it.

When all the LDRs get triggered or remain un triggered, you will observe white and black light indications respectively. Following points may be carefully noted:

1. Pot meters VR1, VR2 and VR3 may Be used to adjust the sensitivity of the LDRs.

2. Common ends of the LDRs should be connected to positive supply.

3. Use good quality light filters. The LDR is mounded in a tube, behind a lens, and aimed at the object.

The colored glass filter should be fixed in front of the LDR as shown in the figure. Make three of that kind and fix them in a suitable case. Adjustments are critical and the gadget performance would depend upon its proper fabrication and use of correct filters as well as light conditions.

HOUSE SECURITY SYSTEM:

Here is a low-cost, invisible laser circuit to protect your house from thieves or trespassers. A laser pointer torch, which is easily available in the market, can be used to operate this device.

The block diagram of the unit shown in Fig. 1 depicts the overall arrangement for providing security to a house.

A laser torch powered by 3V power supply is used for generating a laser beam. A combination of plain mirrors M1 through M6 is used to direct the laser beam around the house to form a net.

The laser beam is directed to finally fall on an LDR that forms part of the receiver unit as shown in Fig. 2. Any interruption of the beam by a thief/ trespasser will result into energizing of the alarm.

The 3V power-supply circuit is a conventional full-wave rectifier-filter circuit. Any alarm unit that operates on 230V AC can be connected at the output.

The receiver unit comprises two identical step-down transformers (X1 and X2), two 6V relays (RL1 and RL2), an LDR, a transistor, and a few other passive components.

When switches S1 and S2 are activated, transformer X1, followed by a full-wave rectifier and smoothing capacitor C1, drives relay RL1 through the laser switch.

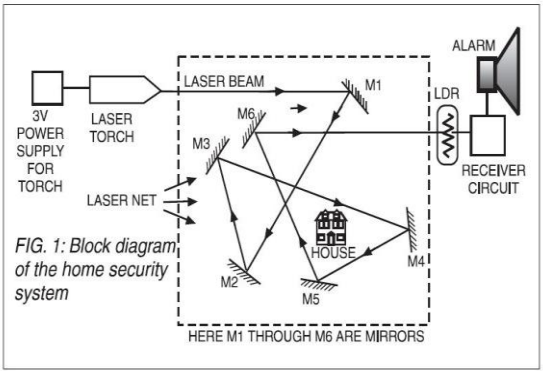


FIG. 1: Block diagram of the home security system

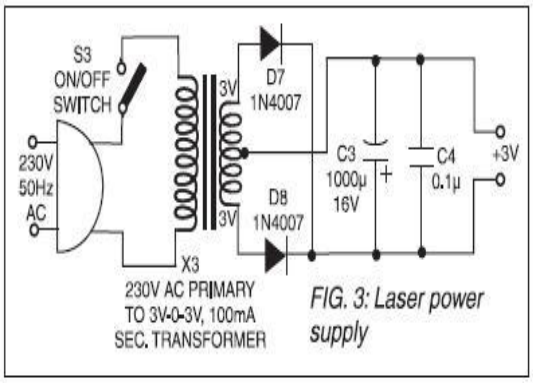


FIG. 3: Laser power supply

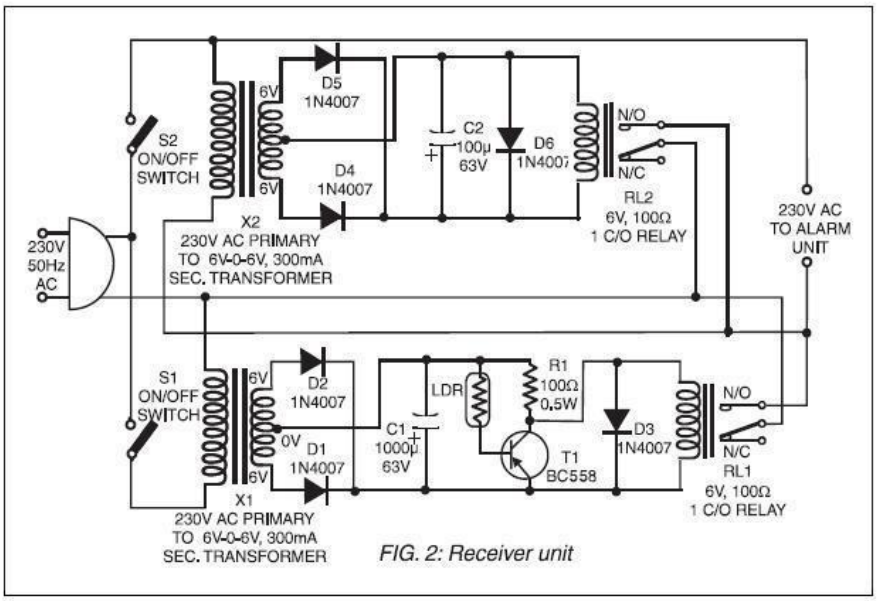


FIG. 2: Receiver unit

The laser beam should be aimed continuously on LDR. As long as the laser beam falls on LDR, transistor T1 remains forward biased and relay RL1 is thus in de-energized condition.

When a person crosses the line of laser beam, relay RL1 turns on and transformer X2 gets power supply and RL2 energizes. In this condition, the laser beam will have no effect on LDR and the alarm will continue to operate as long as switch S2 is on.

When the torch is switched on, the pointed laser beam is reflected from a definite point/ place on the periphery of the house. Making use of a set of properly oriented mirrors one can form an invisible net of laser rays as shown in the block diagram. The final ray should fall on LDR of the circuit.

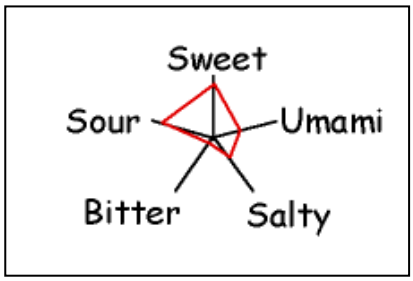
By:

Mr.J.Arun Pandiyan.
Second year (MEIEA).

Reference: EFY Magazine.

TASTE SENSORS:

A sensor is a device that changes various types of physiochemical properties of a target to a different state (usually electrical signals). Our body parts are also sensors. For example, we have sensors for sight, hearing, touch, taste and smell.



Taste sensors, also known as artificial tongues or electronic tongues, measure and compare taste. These provide a quantified, objective scale and find applications in food, beverage and pharmaceuticals industries.

Human tongue has about 10,000 taste buds with five taste sensations: sweet, bitter and savory (also called umami), which work with a signal through G-protein coupled receptors, and salty and sour, which work with ion channels.

Electronic tongues are analytical instruments. Some electronic tongues work using multiple least-square techniques.

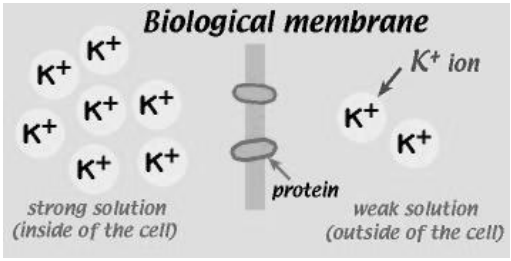
Some scientists have also looked at using acoustic devices, with so-called quartz crystal microbalances said to be one of the first sensors that work by measuring frequency changes due to mass changing on device surface. Shear horizontal surface acoustic wave (SH-SAW) micro sensors are used to analyze complicated metallic tastes.

Principle of working:

Liquid samples are directly analyzed without any preparation, whereas solids require preliminary dissolution before measurement. Reference electrode and sensors are dipped for 120 seconds in a beaker containing a test solution.

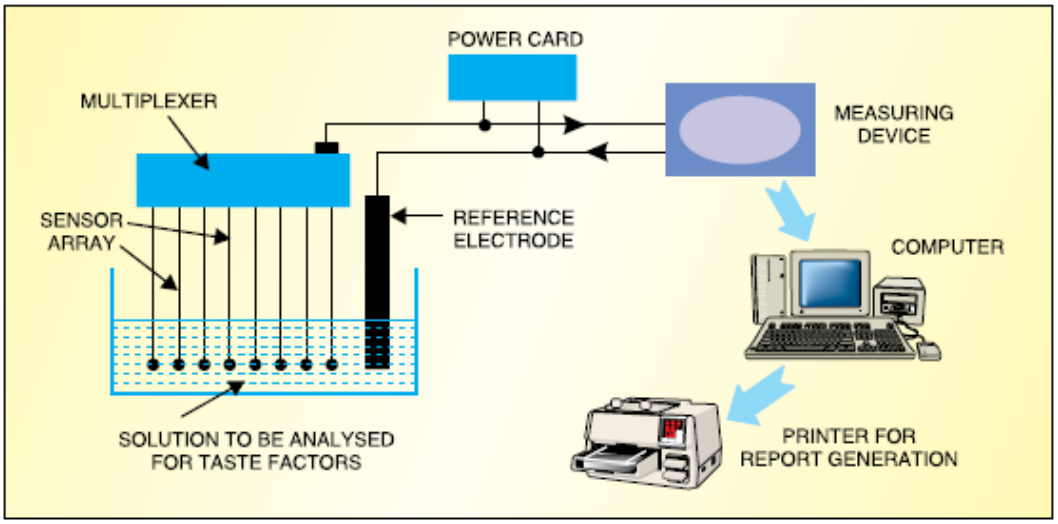
A potentiometric difference between each sensor and a reference electrode is measured by means of a measuring device and recorded by an e-tongue software.

An electronic tongue module for the food and beverage industry may have a sensor board (having 0 to 28 channels), acquisition board (acquisition frequency of 50 Hz), power supply card of 220V-240V AC, and software for soft control and monitoring the sensor array system. Toko & Hayashi Lab is the first in the world to successfully develop wafer-like taste sensors.



Twelve sets of MOS array with pattern recognition software have been used for discriminating between Brazilian and Columbian coffee. Oxide gas sensors are used for alcohol and tobacco testing.

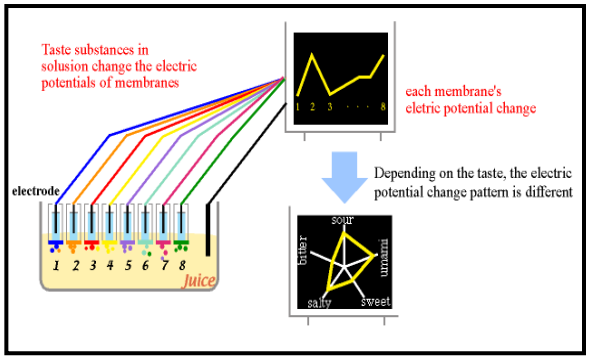
Sour taste sensors have been found to be the primary gateway in mammals for detection of spoiled and unripe food. These receptors are found in a subpopulation of taste sensor cells of tongue that do not function in sweet, bitter or umami.



Taste researchers report that our taste sensors can be effectively used to detect such spoiled food. Sweet sensor is a small, cheap lab-on- a chip sensor that quickly identifies sweetness one of the five primary tastes.

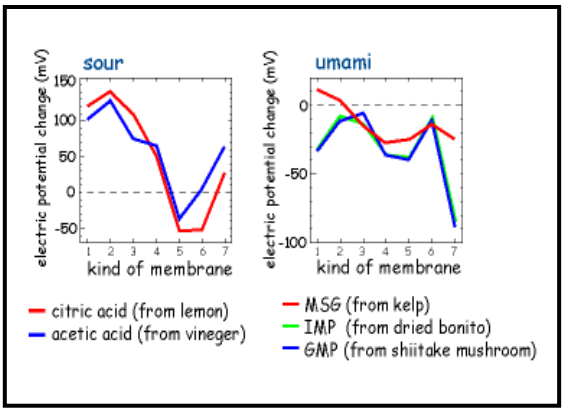
Taste Recognition Mechanism:

Electronic tongues recognize taste using the same three levels as humans: the receptor level (taste buds in humans, lipid membrane of sensors in electronic tongues), the circuit level (neural transmission in humans, transducers in the electronic tongues) and the perceptual level (cognition in the thalamus in humans, statistical analysis by software in electronic tongues).



The electronic tongue uses a sensor-probe assembly to detect organic and inorganic compounds.

Each probe shows cross-sensitivity and selectivity, so each sensor could concurrently contribute to the detection of substances in the liquid matrix.



These sensors have an organic coating that is sensitive to the species to analyze in the samples and a transducer that allows conversion of the membrane response into signals that will be analyzed.

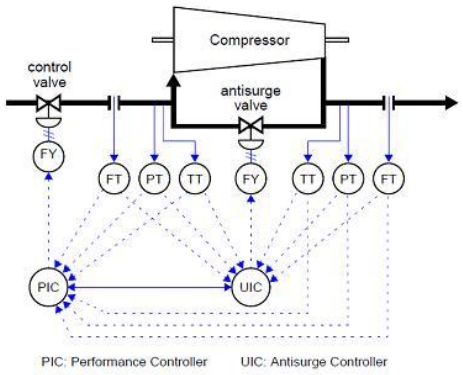
At the circuit level, the sample is quantified, digitized and results are recorded.

By:

Mr.S.Senthil kumar,
Lecturer(MEIEA).

COMPRESSOR CONTROL :

Every axial and centrifugal compressor will experience damaging phenomenon known as surge when the flow through the compressor drops below a certain level. To prevent surge, this minimum flow level must be maintained by blowing-off a portion of the discharge to the atmosphere or recycling it back to the compressor inlet. The recycle or blow off flow is controlled by an antisurge valve, as shown in the simplified compressor control configuration in Figure. The throughput of the compressor is controlled by a performance control element, which can be a control valve (as shown), inlet guide vanes, or a rotational speed controller.



The control system for the compressor must manipulate the performance control element and the antisurge valve to prevent surge-induced compressor damage or process upsets, while keeping a process variable (usually a pressure or flow rate) at a desired level. The Control System, these requirements are satisfied by a combination of Performance and Antisurge Controllers. A single Antis urge Controller can be combined with a single Performance Controller to provide complete surge protection and capacity control for a single-section compressor operating with fixed or variable speed, geometry (guide vane angle), gas composition, and inlet conditions. More complex compressor systems can be controlled and protected by networks of Antisurge, Performance, Fuel, Speed, and Extraction Controllers. To adequately protect a multisection compressor, each section should be protected by its own Antisurge Controller.

PERFORMANCE CONTROL PRINCIPLES:

A dynamic compressor is essentially a device for adding energy to a flowing gas. Its performance can be illustrated by plotting the specific energy increase of the gas (commonly referred to as head) against the flow rate on a compressor map, as shown in Figure. Compressor maps employ a variety of coordinate systems

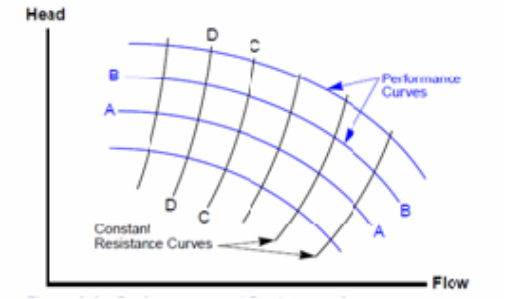
Head might be represented by a single variable (such as discharge pressure), a simple function (such as compression ratio), or a complex function of many variables (such as polytrophic head).

Flow might be represented by anything from a simple measurement (such as pressure drop across an orifice plate in the suction or discharge line) to a complex function (such as pressure and temperature-compensated volumetric flow in suction). Because the power consumption of the compressor is the product of the head, flow rate, and efficiency, it is also possible to plot head against power consumption or power against flow.

In most coordinate systems, the relationship between head and flow depends on one or more additional variables (such as suction temperature and pressure, gas composition, rotational speed, or inlet guide vane position). If all of these variables are

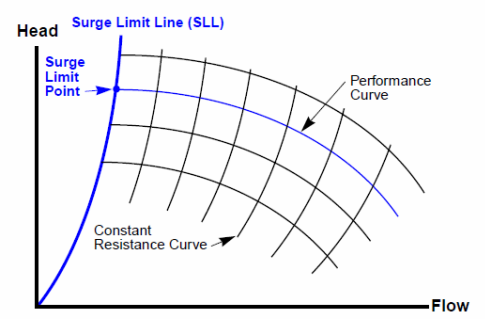
held constant, the performance of the compressor can be represented by a single curve on the compressor map, such as curve AA in Figure.

As one of these variables is changed, a series of performance curves will be generated on the compressor map, each representing the performance of the compressor at a different value of that variable, as illustrated in blue in Figure. For example, at a certain guide vane angle, the compressor may operate on performance curve AA. If the guide vane angle were changed to another value, the performance of the compressor would switch to another performance curve, such as BB.



Dynamic compressors are generally used to force a gas through some combination of inlet and outlet piping, valves, and process vessels which produce a certain amount of resistance. The head required to maintain various flows through this network resistance can be plotted as a series of resistance curves on the compressor map, as shown in black in Figure.

Each curve represents the resistance, or load, for a certain network configuration. For example, an increase in network resistance, such as the closing of a downstream valve, would cause the network resistance to jump from resistance curve CC to another resistance curve, such as DD. At any given instant, the operation of a compressor can be represented by a single performance curve, and its load represented by a single resistance curve, as shown in Figure. The intersection of these curves represents the operating point of the compressor. Steady-state operation at this point occurs when the energy added to the gas equals that required to overcome the network resistance. Any change in operating conditions will cause the flow, head, and compressor speed (if variable) to change until a new steady state is established.



The task of the Antisurge Controller is to keep the operating point to the right of the SLL. This is accomplished by opening the antisurge valve to recycle enough gas to maintain the required minimum flow rate. The tasks of the Performance Controller are to: maintain a process variable (such as discharge pressure) at a set point level; Maintain any process limiting variables within a safe or acceptable range (for example, to prevent motor current overload); and distribute the total flow or pressure demand of processes using more than one compressor.

By:

V.J.V.Naga bushanam,
Final year (MEIEA).

MIND TWISTER:

1. The right most non-zero digit of number 30^{2720}?
   a) 1 b) 3 c) 7 d) 9

2. Glossary: word ::
   a) Catalogue: Dates
   b) Atlas: Maps
   c) Almanac: Synonyms
   d) Thesaurus: Rhyms

3. Who is the chief minister of Maharashtra?
   a) Ashok Chavan
   b) Vilasrao Deshmukh
   c) Pranabh Mukherjee
   d) Arun Jaitely

4. Who is the minister of external affairs?
   a) S.M.Krishna
   b) Farooq Abdullah
   c) Mamtha Banerjee
   d) Jairam Ramesh

5. Who is the chairman of common wealth organizing committee?
   a) Briraj Verma
   b) Suresh Kalmadi
   c) Sarath Pawar
   d) Nagendra Singh

6. the world ranking of Saina Nehwal in Badmitton is
   a) 1 b)2 c) 3 d)4

7. Who won the national award 09 for the best actor in male category?
   a) Aamir Khan
   b) Mohanlal
   c) Naseerudhin Shah
   d) Prakash Raj

8. Miss Universe 2010 belongs to
   a) Brazil b) Mexico
   c) Netherland d) Germany

9. Who is the founder of Bio-Con limited?
   a) Kiran Mazmumdhar
   b) Anandh Malhothra
   c) Shanaaz Hussain
   d) Rajeev Choudhary

10. Who is The Chairman of Bharti Airtel?
   a) Sunil Mittal b) Rahul Mittal
   c) Lakshmi Mittal d) Rajeev Mittal

11. The Combined Package of LED & Photo Diode is
   a) Voltaic Cell b) Solar Cell
   c) LCD d) Optocoupler

12. Which of the following device have two SCR'S?
   a) DIAC b) TRIAC
   c) FET d) LASCR

13. Which one of the devices used for high temperatures measuring?
   a) Thermocouple
   b) Thermistor
   c) RTD
   d) Pyrometer

14. Select the programmable device having 16 bit address bits?
   a) intel 8008 b) intel 8080
   c) intel 8085 d) intel 8086

15. Select the type of controller used for temperature control.
   a) P b) PI c) PD d) PID

By:

Mr. N.Balasubramaniam,
Final year (MEIEA).

PERSONALITY OF THE MONTH:

SATYENDRA NATH BOSE

Born	**:**	**1 January 1894 (1894-01-01) Calcutta, India**
Died	**:**	**4 February 1974 (aged 80) Calcutta, India**
Residence	**:**	**India**
Nationality	**:**	**Indian**
Fields	**:**	**Physics**
Institutions	**:**	**University of Calcutta University of Dhaka**
Alma mater	**:**	**Presidency College of University of Calcutta**
Doctoral advisor	**:**	**Sahill Poddar**
Known for	**:**	**Bose–Einstein condensate, :Bose–Einstein statistics, Bose gas**

Satyendra Nath Bose (1 January 1894 – 4 February 1974), FRS, was an Indian physicist, specializing in mathematical physics. He is best known for his work on quantum mechanics in the early 1920s, providing the foundation for Bose-Einstein statistics and the theory of the Bose-Einstein condensate.

He is honoured as the namesake of the boson. He was awarded India's second highest civilian award, the Padma Vibhushan in 1954 by the Government of India.

Although more than one Nobel Prize was awarded for research related to the concepts of the boson, Bose-Einstein statistics and Bose-Einstein condensate the latest being the 2001 Nobel Prize in Physics, which was given for advancing the theory of Bose-Einstein condensates Bose himself was not awarded the Nobel Prize. Among his other talents, Bose spoke several languages and could also play the esraj, a musical instrument similar to a violin.

EARLY LIFE AND CAREER:

Bose was born in Kolkata (Calcutta), India, the eldest of seven children. His father, Surendranath Bose, worked in the Engineering Department of the East Indian Railway Company. Bose attended Hindu School in Calcutta, and later attended Presidency College, also in Calcutta, earning the highest marks at each institution.

He came in contact with teachers such as Jagadish Chandra Bose and Prafulla Chandra Roy who provided inspiration to aim high in life. From 1916 to 1921 he was a lecturer in the physics department of the University of Calcutta.

In 1921, he joined the department of Physics of the then recently founded Dhaka University (now in Bangladesh and called University of Dhaka).

In 1924, while working as a Reader at the Physics Department of the University of Dhaka, Bose wrote a paper deriving Planck's quantum radiation law without any reference to classical physics and using a novel way of counting states with identical particles. This paper was seminal in creating the very important field of quantum statistics. After initial setbacks to his efforts to publish, he sent the article directly to **Albert Einstein** in Germany.

Einstein, recognizing the importance of the paper, translated it into German himself and submitted it on Bose's behalf to the prestigious Zeitschrift für Physik.

As a result of this recognition, Bose was able to leave India for the first time and spent two years in Europe, during which he worked with

Louis de Broglie,
Marie Curie,
Einstein.

After his European stay S N Bose returned to Dhaka in 1926. He became a professor and was made head of the Department of Physics, and continued teaching at Dhaka University until 1945.

He was also Dean of the Faculty of Science at Dhaka University for a long period. When the partition of India became imminent, he returned to Calcutta and taught at Calcutta University until 1956, when he retired and was made professor emeritus.

Since the coins are distinct, there are two outcomes which produce a head and a tail. The probability of two heads is one-quarter.

While presenting a lecture [citation needed] at the University of Dhaka on the theory of radiation and the ultraviolet catastrophe, Bose intended to show his students that the contemporary theory was inadequate, because it predicted results not in accordance with experimental results.

During this lecture, Bose committed an error in applying the theory, which unexpectedly gave a prediction that agreed with the experiment. (He later adapted this lecture into a short article called Planck's Law and the Hypothesis of Light Quanta.)

The error was a simple mistake similar to arguing that flipping two fair coins will produce two heads one-third of the time that would appear obviously wrong to anyone with a basic understanding of statistics. However, the results it predicted agreed with experiment, and Bose realized it might not be a mistake at all.

He for the first time took the position that the Maxwell-Boltzmann distribution would not be true for microscopic particles where fluctuations due to Heisenberg's uncertainty principle will be significant.

Thus he stressed the probability of finding particles in the phase space, each state having volume h^3, and discarding the distinct position and momentum of the particles.

Physics journals refused to publish Bose's paper. It was their contention that he had presented to them a simple mistake, and Bose's findings were ignored. Discouraged, he wrote to Albert Einstein, who immediately agreed with him.

His theory finally achieved respect when Einstein sent his own paper in support of Bose's to Zeitschrift für Physik, asking that they be published together. This was done in 1924. Bose had earlier translated Einstein's theory of General Relativity from German to English.

The reason Bose's **"mistake"** produced accurate results was that since photons are indistinguishable from each other, one cannot treat any two photons having equal energy as being two distinct identifiable photons. By analogy, if in an alternate universe coins were to behave like photons and other bosons, the probability of producing two heads would indeed be one-third **(tail-head = head-tail).** Bose's "error" is now called Bose-Einstein statistics.

Einstein adopted the idea and extended it to atoms. This led to the prediction of the existence of phenomena which became known as Bose-Einstein condensate, a dense collection of bosons (which are particles with integer spin, named after Bose), which was demonstrated to exist by experiment in 1995.

LATER WORK:

Bose's ideas were afterwards well received in the world of physics, and he was granted leave from the University of Dhaka to travel to Europe in 1924.

He spent a year in France and worked with Marie Curie, and met several other well-known scientists.

He then spent another year abroad, working with Einstein in Berlin. Upon his return to Dhaka, he was made a professor in 1926.

He did not have a doctorate, and so ordinarily he would not be qualified for the post, but Einstein recommended him. His work ranged from X-ray crystallography to unified field theories. He also published an equation of state for real gases with Megh Nad Saha.

Apart from physics he did some research in biochemistry and literature (Bengali, English). He made deep studies in **chemistry, geology, zoology, anthropology, engineering and other sciences.**

Being an Indian of Bengali descent, he devoted a lot of time to promoting Bengali as a teaching language, translating scientific papers into it, and promoting the development of the region.

In 1944 Bose was elected General President of the Indian Science Congress. In 1958 he became a Fellow of the Royal Society.

By:

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DIAMOND IS A GOOD THERMAL CONDUCTOR BUT IT IS AN EXCELLENT ELECTRICAL INSULATOR HOW?

Diamond crystal is a three-dimensional network of carbon atoms. All carbon atoms in the network are strongly bonded by carbon-carbon covalent bonds. Therefore diamond crystal has a highly symmetric cubic structure. The carbon atoms in diamond are precisely aligned. Thus diamond is an ideal crystal. Atoms in the crystal lattices in solids vibrate.

These vibrations, called the atomic vibrations facilitate thermal conduction (transport of heat) in solids. In an ideal crystal, the lattices are so precisely aligned that they do not interact with each other.

Therefore an ideal crystal conducts better than a non-ideal crystal resulting in ideal crystals having good thermal conductivity, which is a measure of heat conduction. Diamond being an ideal crystal is thus a good thermal conductor.

Mobile electrons facilitate electrical conduction - flow of current in solids. There are no free mobile electrons in diamond crystal to facilitate electrical conduction. Thus

HOW IS VIBRATION PRODUCED WHEN MOBILES ARE PUT ON THE VIBRATE MODE?

A small motor that has an un-even or **unbalanced** weight on its output shaft is commonly found inside mobile phones that offer vibration mode.

When this motor rotates, the rotating uneven weight on the output shaft causes the mobile phone to vibrate.

Similar mechanisms are also found in:

- Play station (gaming devices),
- Dual Shock,
- XBOX,
- Wii controllers.

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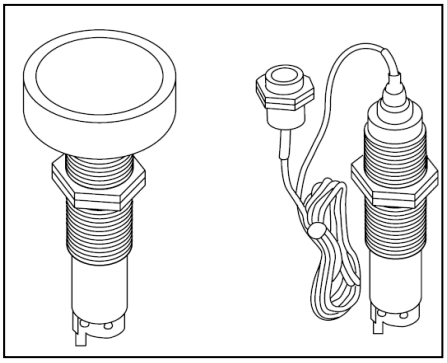
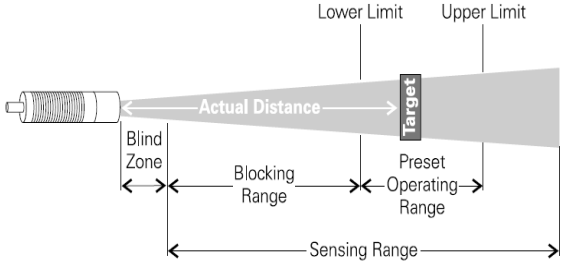
ULTRASONIC PROXIMITY SENSORS:

Ultrasonic proximity sensors use a transducer to send and receive high frequency sound signals. When a target enters the beam the sound is reflected back to the switch, causing it to energize or de-energize the output circuit.

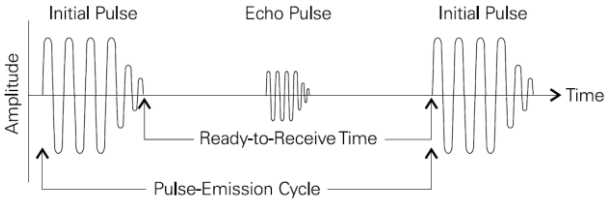


A piezoelectric ceramic disk is mounted in the sensor surface. It can transmit and receive high-frequency pulses. A high frequency voltage is applied to the disk, causing it to vibrate at the same frequency. The vibrating disk produces high-frequency sound waves. When transmitted pulses strike a sound-reflecting object, echoes are produced. The duration of the reflected pulse is evaluated at the transducer.

When the target enters the preset operating range, the output of the switch changes state. When the target leaves the preset operating range, the output returns to its original state.



The emitted pulse is actually a set of 30 pulses at amplitude of 200Kv. The echo can be in micro volts. A blind zone exists directly in front of the sensor. Depending on the sensor the blind zone is from 6 to 80 cm. An object placed in the blind zone will produce an unstable output. The time interval between the transmitted signal and the echo is directly proportional to the distance between the object and sensor.



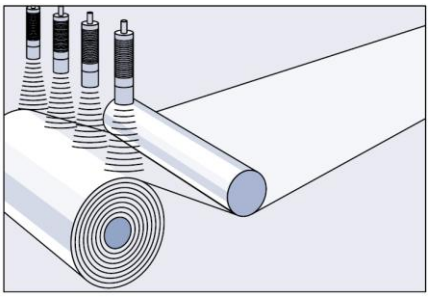
The operating range can be adjusted in terms of its width and position within the sensing range. The upper limit can be adjusted on all sensors. The lower limit can be adjusted only with certain versions. Objects beyond the upper limit do not Produce a change at the output of the sensor. This is known as "blanking out the background".

On some sensors, a blocking range also exists. This is between the lower limit and the blind zone. An object in the blocking range prevents identification of a target in the operating range. There is a signal output assigned to both the operating range and the output range.

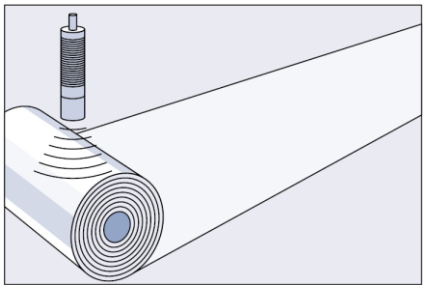
The radiation pattern of an ultrasonic sensor consists of a main cone and several neighboring cones. The approximate angle of the main cone is 5°.Free zones must be maintained around the sensor to allow for neighboring cones. The following examples show the free area required for different situations.

APPLICATIONS:

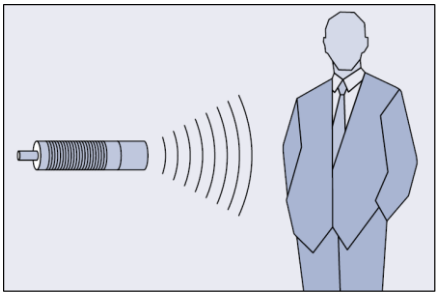
1) **Contour Recognition**



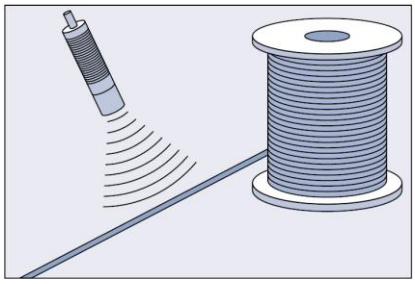
2) **Diameter Sensing and Strip Speed Control**



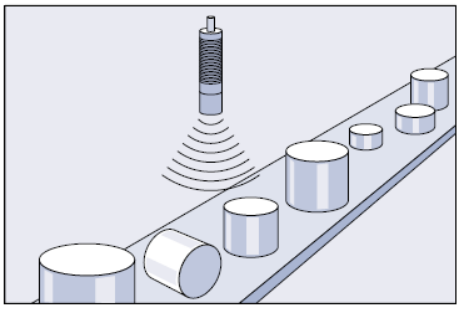
3) **People Sensing**



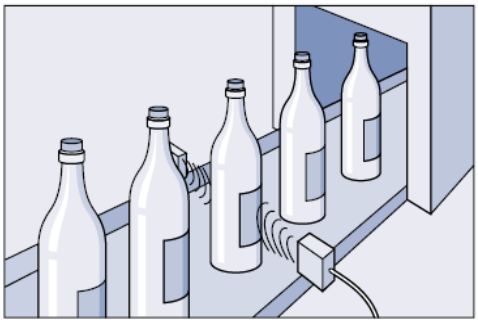
4) **Wire and Rope Breakage Monitoring**



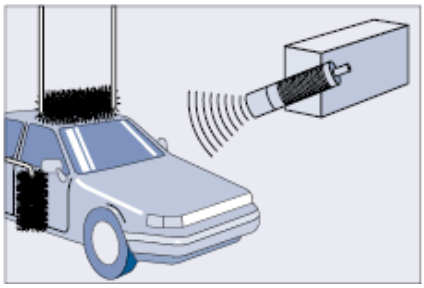
5) **Quality Control**



6) **Bottle Counting**



7) **Vehicle Sensing and Positioning**



By:

P.Dheenadhayalan,
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AVIONICS:

Most of the new technology was electronic; hence, the expression "aviation electronics" arose and was later shortened to "avionics."

Role of avionics in electronic instruments used in air or space flight; also the design and production of such instruments.

Early planes had few instruments, but as aviation and aircraft became more complex, so did instrumentation. After World War II, the increasing sophistication of military avionics helped spawn a proliferation of electronic applications to commercial and private aviation.

Avionics includes numerous types of devices, including those used for navigation (see air navigation); control instruments that aid in steering and controlling the craft; and performance indicators, such as altimeters and velocity gauges.

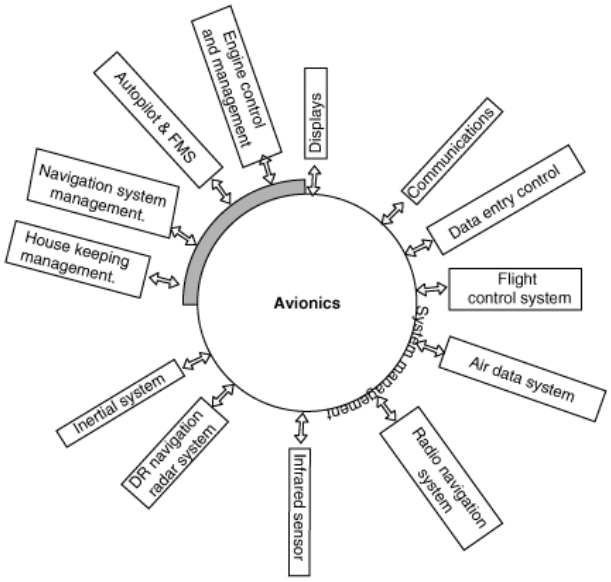
Avionics, a term derived by combining aviation and electronics, describes all of the electronic navigational, communications, and flight management aids with which airplanes are equipped today.

In military aircraft it also covers electronically controlled weapons, reconnaissance, and detection systems.

Until the 1940s, the systems involved in operating aircraft were purely mechanical, electric, or magnetic, with radio apparatus being the most sophisticated instrumentation.

The advent of radar and the great advance made in airborne detection during World War II led to the general adoption of electronic distance-measuring and navigational aids. In military aircraft such devices improve weapon delivery accuracy, and in commercial aircraft they provide greater safety in operation.

Derived from the expression "aviation electronics", the development and production of electronic instruments for use invitation and astro nautics. The term also refers to the instruments themselves. Such instruments consist of a wide variety of control, performance, and radio navigation devices and systems.



A field of applied research in which electronic devices are adapted to use in aviation. Avionics are aeronautical electronics, not necessarily restricted to aerodynes only.

Although the term implies use of equipment in airborne applications only, it also extends to ground-based equipment like radar and surface-to-air weapons. Flying is what we love to do. Making it safer, easier and more fun is our mission.

As pilots, we all recognize the many benefits that modern technology can provide. But we've also seen that technology is sometimes difficult to Learn and hard to use; in other words, sometimes more trouble than it's worth.

That's where Seattle Avionics comes in. We're a group of pilots and programmers who've taken a careful look at the current flight software and decided that there must be a better way.

Today, pilots throughout the world look forward to flying the Pro Line 21 flight deck. Standard in every Encore+, this fully integrated system will take pilots and passengers anywhere and everywhere with greater confidence – including far into the future.

Consolidating all primary flight, navigation, engine and sensor data in large, easy-to-scan active-matrix LCDs, the Pro Line 21 package is one of the industry's best for information management and intuitive, at-a-glance situational awareness

The science and technology of electronics and the development of ele ctronic devices as applied to aeronautics and astronautics: Avionics has become even more important with the development of the space program.

The electronic systems, equipm ent, and other devices so developed; the avionics on this spacecraft represent a new Generation of sophistication.

By:

Mr.M.Mohammed Arif,
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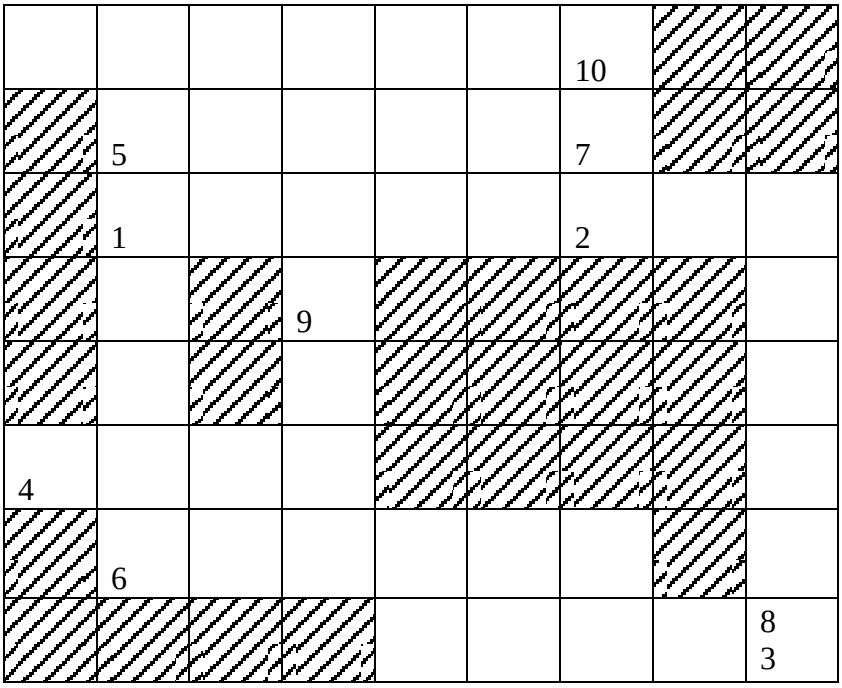
CROSS WORD:



1. This flow causes the production of current.
   (8 letters, from left to right).

2. It has positive temperature coefficient.
   (3 letter, bottom to top).

3. It is pocket of energy.
   (6 letter, bottom to top).

4. Solve and convert the unit.[$10^{-5}*10^{+6}*10^{+3}*10^{-1}$].
   (4 letter, left to right).

5. It is one of the temperature unit.
   (6 letter, top to bottom).

6. He proposed the force law.
   (6 letter, left to right).

7. Is the bidirectional device, two SCR turned in a parallel direction.
   (5 letter, right to left).

8. This crystal produces voltage when stress is applied.
   (5 letter, right to left).

9. It is the unit of inverse of resistance.
   (3 letter, top to bottom).

10. It is a type of flow meter.
    (7 letter, right to left).

By:

Mr.N.Balasubramaniam,
Final year (MEIEA).

DIGITAL GHZ SCOPES
(Analyze Million Waveforms in A Second):

Designed for speed and signal fidelity as digital instruments from the ground up, RTO10XX series oscilloscopes can analyze one million waveforms per second, allowing even the least-frequent errors to be seen in an instant. Initially available in two and four-channel models with 1& 2GHz bandwidths and a maximum sampling rate of 10 Sample/s, the scopes are the first to feature a fully digital trigger system, thereby minimizing trigger jitter so that glitches as small as 100 ps can be reliably detected.

The scopes' 1-Mwaveform/s acquisition rate is achieved using a custom ASIC to perform real-time digital processing of measurements at a rate significantly faster than conventional scopes.

Each channel's 8-bit ADC operates at 10 Gega samples/s; interleaving, with the possibility of ADC mismatch is thus avoided, thereby providing more than seven effective bits for a very high dynamic range, minimal signal distortion, and low inherent noise.

Unlike conventional trigger systems that must deal with time and amplitude offset between the analog trigger path and the digital signal acquisition path, the RTO series provides purely digital trigger architecture, with the trigger and the captured data sharing a common signal path and a common time base.

A completely rethought user interface featuring advanced 10.4-in.-touchscreen operation, semitransparent dialog boxes, movable measurement windows, configurable toolbar, and preview icons with live waveforms provides an highly effective waveform overview even for complex measurements.

I/O MODEMS :

ZXT24-RM radio modems are available in 900-MHz (long-range) and 2.4-GHz (short-range) versions for transmitting and receiving sensor or serial data in harsh and remote environments. Wirelessly emulating wired technology, the units mount directly to panels, poles, or machines, thereby eliminating the need for long wire runs and the cost of cabinets or enclosures.

Based on a license-free proprietary RF scheme for reliable point-to-point and point-to-multipoint wireless communication, the unit's wireless sensor transceiver technology connects data loggers, controls, or (SCADA) equipment with up to 99% of sensors on the market.

The I/O modules include two analog inputs, two analog outputs, two digital inputs, and two relay outputs. A pair of I/O modules can replace wired configurations to transmit remote I/O to a controller; an auto-configure feature lets users quickly map two units without a PC.

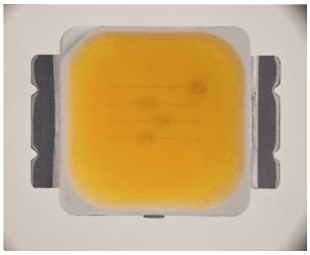
Alternatively, users can connect one or many remote I/O modules to a radio modem, which transmits Modbus I/O data into the serial port of a controller such as a PLC, SCADA or HMI. Plug-and-play design lets users quickly configure two identical I/O modules with the push of a button. No additional converters or factory adjustments are needed.

Other features include selectable I/O, both digital (PNP/NPN) and analog (0 to 5 or 10 V, 0 to 20 mA, or 4 to 20 mA). A fail-safe output state resets I/O to a user-defined state in the event of communication failure, and, in Modbus modes, exception reporting can send trouble alerts through any connected devices. The highly secure, 256-bit AES-encrypted modems offer low-latency (8 ms) response rates.

The IP67-rated units operate from −40° to 74°C and meet heavy EN61000-6-2 industrial specifications, so they can handle the surges and electromagnetic interference common in welding operations, variable frequency drives, very large pumps, and other extreme electrical environments.

XLamp MX-3 PLCC LED :

The XLamp MX-3 PLCC LED is said to offer enhanced light uniformity and LED-to-LED color consistency, thus suiting it not only for LED bulbs, but also retail display lighting and high-flux distributed illumination, such as cove lighting and so-called wall washing.



Available in white color temperatures ranging from 2,600 to 8,300 K, LEDs in the 2,600 to 4,300-K range can be specified from any of 64 bins, while those in the 4,300 to 8,300-K range can be chosen from any of 40 bins, thereby allowing designers to ensure tight color consistency and uniform angular chromaticity in their products.

The LEDs have a luminous flux to 122 lm at 350 mA in cool white (6,500 K) and 100 lm at 350 mA in warm white (3,500 K).

The 6.5 x 5 x 1.35-mm LEDs have the same footprint as the earlier MX-6 devices, making design changes much simpler. The new LEDs also have a 120° viewing angle, provide an electrically neutral thermal path, are RoHS compliant, and can be stored at ≤30°C/85% RH indefinitely.

By:

Mr.S.Santhosh Kumar,
Second year (MEIEA).

"COMING TOGETHER IS A BEGINNING,
KEEPING TOGETHER IS PROGRESS,
WORKING TOGETHER IS SUCCESS."

Team work leads to success
we proved it...