ELECTRONICS AND INSTRUMENTATION ENGINEERS ASSOCIATION

MUTHAYAMMAL ENGINEERING COLLEGE

RASIPURAM- 637 408, NAMAKKAL(DT).

INSTRONICS

The best INSTRUMENTATION Magazine JUL, 25th 2012, vol. 15

iMAC G4

CATALYTIC BEAD SENSOR

YEAR: 2012 ISSUE:3 VOL:15 JUL

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 comments 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 Beloved Principal ***Dr.M.Madheswaran***
For his valuable guidance and encouragement in bringing up this magazine ***"INSTRONICS"*** *successfully.*

- ***EIE ASSOCIATION***

TERMS &DEFINITIONS:

NEMA-4:

A standard from the National Electrical Manufacturers Association, which defines enclosures intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water.

NEMA-7:

A standard from the National Electrical Manufacturers Association, which defines explosion-proof enclosures for use in locations classified as Class I, Groups A, B, C or D, as specified in the National Electrical Code.

Nernst Equation:

A mathematical description of electrode behavior: E is the total potential, in mill volts, developed between the sensing and reference electrodes.

Ex varies with the choice of electrodes, temperature, and pressure: 2.3RT/nF is the Nernst factor (R and F are constants, n is the charge on the ion, including sign, T is the temperature in degrees Kelvin), and ai is the activity of the ion to which the electrode is responding.

Nernst Factor (S, Slope):

The term 2.3RT/nF is the Nernst equation, which is equal (at T = 25°C) to 59.16 mV when n = 1 and 29.58 mV when n - 2, and which includes the sign of the charge on the ion in the term n. The Nerst factor varies with temperature.

Nicrosil/Nisil:

A nickel chrome/nickel silicone thermal alloy used to measure high temperatures. Inconsistencies in thermoelectric voltages exist in these alloys with respect to the wire gage.

NMR (Normal-Mode Rejection):

The ability of a panel meter to filter out noise superimposed on the signal and applied across the SIG HI to SIG LO input terminals.

Normally expressed in dB at 50/60 Hz.

Normal Hydrogen Electrode:

A reversible hydrogen electrode (Pt) in contact with hydrogen gas at 1 atmosphere partial pressure and immersed in a solution containing hydrogen ions at unit activity.

Normal-mode Rejection Ratio:

The ability of an instrument to reject interference usually of line frequency (50-60 Hz) across its input terminals.

NEMA-12:

A standard from the National Electrical Manufacturers Association, which defines enclosures with protection against dirt, dust, splashes by non-corrosive liquids, and salt spray.

NEMA-Size Case:

An older US case standard for panel meters, which requires a panel cutout of 3.93 x 1.69 inches.

Network:

A group of computers that are connected to each other by communications lines to share information and resources.

By:

Mr.S.Karthik,
Final Year (MEIEA).

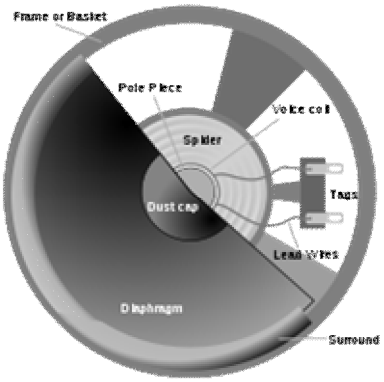
CHESTER W. RICE:

The moving-coil principle commonly used today in direct radiators was patented in 1924 by Chester W. Rice and Edward W. Kellogg. The key difference between previous attempts and the patent by Rice and Kellogg is the adjustment of mechanical parameters so that the fundamental resonance of the moving system is below the frequency where the cone's radiation impedance becomes uniform.

These first loudspeakers used electromagnets, because large, powerful permanent magnets were generally not available at a reasonable price. The coil of an electromagnet, called a field coil, was energized by current through a second pair of connections to the driver. This winding usually served a dual role, acting also as a choke coil, filtering the power supply of the amplifier that the loudspeaker was connected to. AC ripple in the current was attenuated by the action of passing through the choke coil. In the 1930s, loudspeaker manufacturers began to combine two and three band passes' worth of drivers in order to increase frequency response and sound pressure level.

Subsequently, continuous developments in enclosure design and materials led to significant audible improvements. The most notable improvements in modern speakers are improvements in cone materials, the introduction of higher-temperature adhesives, improved permanent magnet materials, improved measurement techniques, computer-aided design, and finite element analysis.

Driver design



The most common type of driver, commonly called a dynamic loudspeaker, uses a lightweight diaphragm, or cone, connected to a rigid basket, or frame, via a flexible suspension that constrains a coil of fine tinsel wire to move axially through a cylindrical magnetic gap. When an electrical signal is applied to the voice coil, a magnetic field is created by the electric current in the voice coil, making it a variable electromagnet.

The coil and the driver's magnetic system interact, generating a mechanical force that causes the coil (and thus, the attached cone) to move back and forth, thereby reproducing sound under the control of the applied

electrical signal coming from the amplifier.

Full-Range Drivers

A full-range driver is designed to have the widest frequency response possible. These drivers are small, typically 3 to 8 inches (7.6 to 20 cm) in diameter to permit reasonable high frequency response, and carefully designed to give low-distortion output at low frequencies, though with reduced maximum output level. Full-range (or more accurately, wide-range) drivers are most commonly heard in public address systems, in televisions (although some models are suitable for hi-fi listening), small radios, intercoms, some computer speakers, etc

Subwoofer

A subwoofer is a woofer driver used only for the lowest part of the audio spectrum: typically below 200 Hz for consumer systems, below 100 Hz for professional live sound, and below 80 Hz in THX-approved systems. Because the intended range of frequencies is limited, subwoofer system design is usually simpler in many respects than for conventional loudspeakers, often consisting of a single driver enclosed in a suitable box or enclosure.

Tweeter

Fig.Tweeter

A tweeter is a high-frequency driver that reproduces the highest frequencies in a speaker system. Many varieties of tweeter design exist, each with differing abilities with regard to frequency response, output fidelity, power handling, maximum output level, etc. Tweeters are widely found in home stereo systems, and horn-loaded compression drivers are common in professional sound reinforcement. Ribbon tweeters have gained popularity in recent years, as their output power has been increased to levels useful for professional sound reinforcement, and their output pattern is wide in the horizontal plane, a pattern that has convenient applications in concert sound.

Most loudspeakers uses two wiring points to connect to the source of the signal (for example, to the audio amplifier or receiver). This is usually done using binding posts or spring clips on the back of the enclosure. If the wires for the left and right speakers (in a stereo setup) are not connected "in phase" with each other (the + and − connections on the speaker and amplifier should be connected + to + and − to −), the loudspeakers is out of phase. Given identical signals, motion in one cone is in the opposite direction of the other. This typically causes monophonic material in a stereo recording to be canceled out, reduced in level, and made more difficult to localize, all due to destructive interference of the sound waves.

By:

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POWER INVERTERS:

A Power Inverter is used to convert low voltage direct current (DC) voltage (typically from a 12/24V battery bank or direct from solar panels or wind turbines) into mains power (220-240V AC in the UK, 110V AC in USA). This is very important as it permits you to power domestic appliances such as computers, televisions, lighting and so on from your renewable energy source.

Low voltage DC appliances are available and typically used in mobile homes and caravans, but they are much more expensive, need to be bought in addition to existing appliances, and much thicker cable is required to carry the electricity around.

Therefore power inverters are used to enable existing domestic appliances to be powered by a low voltage DC source. Inverters with conversion efficiencies in excess of 90% are available, so little power is lost going from DC to high voltage AC.

Fig.Power Inverter.

There are two different kinds of power inverter: Modified Sine Wave Inverter (MSWI) and a True Sine Wave Inverter (TSWI). Modified sine wave inverters are much cheaper than true sine wave inverters, but the AC electricity they output is not as clean and can therefore cause interference with some appliances. True sine wave inverters usually output cleaner (i.e. less power spikes) power than even mains electricity and so all appliances can be powered by a TSW Inverter.

Fig. Mini Power Inverter.

Mini Power Inverters are available rated down to as little as 75 Watts (continuous power output, 150 Watts surge) which can be plugged directly into a car's cigarette lighter socket to power a small device such as a GPS systems or personal stereo.

Fig. Battery Bank.

A suitably rated fuse must be fitted between the battery bank and the power inverter to protect against short circuits (if one of the cables connected to the inverter were to come loose for example).

iMac G4:

The iMac G4 was a computer that was produced by Apple from the beginning of 2002 to mid 2004. It replaced the aging iMac G3. The computer had a new design compared to older Macs.

The G4 had a 15-inch LCD which was mounted on an adjustable arm above a hemisphere containing a full-size, tray-loading optical drive and a sixteenth-generation CPU (the PPC 74xx-series). This LCD computer was known and sold as The New iMac, while existing egg-shaped iMac was renamed the "iMac G3" and continued to be sold for a few months. After the iMac G3 was discontinued, it was retroactively labeled iMac G4 to distinguish itself from the succeeding iMac G5.

Fig.iMac G4 Screen

The iMac G4 was sold with the "Apple Pro Keyboard" which would be later renamed the Apple Keyboard and an Apple Pro Mouse which would be later redesigned and named the Apple Mouse. Also, there was an option to buy the "Apple Pro Speakers", which were better quality than the internal speakers, which were low quality due to their size. Apple Pro Speakers had a unique, small adaptor and only worked on a select few macs.

The iMac G4 was incrementally upgraded. They were made available with 17-inch (43 cm) and then 20-inch (51 cm) widescreen LCDs over the following two years. By then, Apple had all but eliminated the CRT machines from its product line. However, the LCD iMacs were unable to match the low price point of the previous iMac G3s, largely because of the higher cost of the LCD technology at the time.

Fig. iMac G4

The iMac G4 was one of the biggest improvements and advancements in Apple Inc's growing empire of Mac desktops. It included Mac OS 9 and Mac OS X due to it being released the year Mac OS 9 "died". The computer was considered completely separate from the previous, half egg shaped G3 models

By:

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NI FPGA:

Field - Programmable Gate Array (FPGA) technology continues to gain momentum, and the worldwide FPGA market is expected to grow to $3.5 billion USD by 2013[1]. Since their invention by Xilinx in 1984, FPGAs have gone from being simple glue logic chips to actually replacing custom Application - Specific Integrated Circuits (ASICs) and processors for signal processing and control applications. Why has this technology been so successful? This article provides an introduction to FPGAs and highlights some of the benefits that make FPGAs unique.

At the highest level, FPGAs are reprogrammable silicon chips. Using prebuilt logic blocks and programmable routing resources, you can configure these chips to implement custom hardware functionality without ever having to pick up a breadboard or soldering iron. The development of digital computing tasks in software and compile them down to a configuration file or bit stream that contains information on how the components should be wired together.

In addition, FPGAs are completely reconfigurable and instantly take on a brand new "personality" when recompile a different configuration of circuitry. In the past, FPGA technology could be used only by engineers with a deep understanding of digital hardware design. The rise of high-level design tools, however, is changing the rules of FPGA programming, with new technologies that convert graphical block diagrams or even 'C' code into digital hardware circuitry.

FPGA chip adoption across all industries is driven by the fact that FPGAs combine the best parts of ASICs and processor-based systems. FPGAs are used to provide hardware-timed speed and reliability, but they do not require high volumes to justify the large upfront expense of custom ASIC design. Reprogrammable silicon also has the same flexibility of software running on a processor-based system, but it is not limited by the number of processing cores available. Unlike processors, FPGAs are truly parallel in nature, so different processing operations do not have to compete for the same resources. Each independent processing task is assigned to a dedicated section of the chip, and can function autonomously without any influence from other logic blocks. As a result, the performance of one part of the application is not affected when you add more processing.

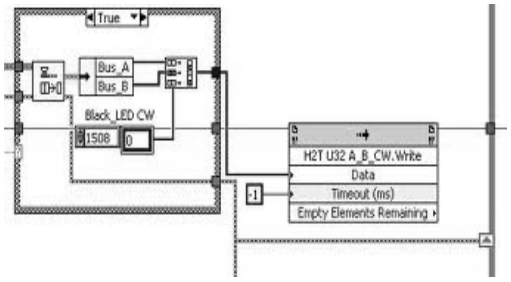

Fig. FPGA Multi Line Transmission.

BENEFITS Of FPGA TECHNOLOGY

Performance:

Taking advantage of hardware parallelism, FPGAs exceed the computing power of Digital Signal Processors (DSPs) by breaking the paradigm of sequential execution and accomplishing more per clock cycle. BDTI, a noted analyst and benchmarking firm, released benchmarks showing how FPGAs can deliver many times the processing power per dollar of a DSP solution in some applications. Controlling Inputs

and Outputs (I/O) at the hardware level provides faster response times and specialized functionality to closely match application requirements.

Time to market:

FPGA technology offers flexibility and rapid prototyping capabilities in the face of increased time-to-market concerns. You can test an idea or concept and verify it in hardware without going through the long fabrication process of custom ASIC design. You can then implement incremental changes and iterate on an FPGA design within hours instead of weeks. Commercial off-the-shelf (COTS) hardware is also available with different types of I/O already connected to a user-programmable FPGA chip. The growing availability of high-level software tools decreases the learning curve with layers of abstraction and often offers valuable IP cores (prebuilt functions) for advanced control and signal processing.

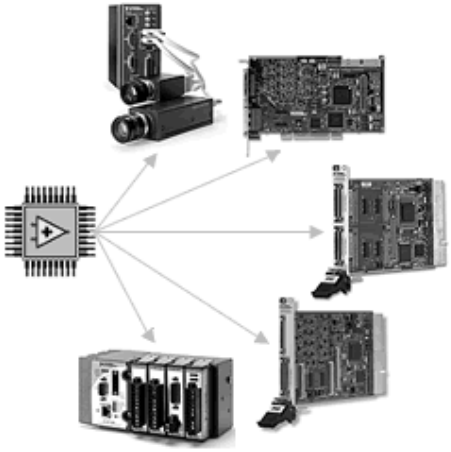

Fig. FPGA Target.

Cost:

The nonrecurring engineering (NRE) expense of custom ASIC design far exceeds that of FPGA-based hardware solutions. The large initial investment in ASICs is easy to justify for OEMs shipping thousands of chips per year, but many end users need custom hardware functionality for the tens to hundreds of systems in development. The very nature of programmable silicon means you have no fabrication costs or long lead times for assembly. Because system requirements often change over time, the cost of making incremental changes to FPGA designs is negligible when compared to the large expense of respinning an ASIC.

Reliability:

While software tools provide the programming environment, FPGA circuitry is truly a "hard" implementation of program execution. Processor-based systems often involve several layers of abstraction to help schedule tasks and share resources among multiple processes. The driver layer controls hardware resources and the OS manages memory and processor bandwidth. FPGAs, which do not use OSs, minimize reliability concerns with true parallel execution and deterministic hardware dedicated to every task.

Long-term maintenance:

As mentioned earlier, FPGA chips are field-upgradable and do not require the time and expense involved with ASIC redesign. Digital communication protocols, for example, have specifications that can change over time, and ASIC-based interfaces may cause maintenance and forward-compatibility challenges. Being reconfigurable.

By:

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ELECTRONIC HYGROMETERS:

Dew point is the temperature at which a sample of moist air (or any other water vapor) at constant pressure reaches water vapor saturation. At this saturation temperature, further cooling results in condensation of water. Chilled mirror dew point hygrometers are one of the most precise instruments commonly available. An accuracy of 0.2 °C is attainable with these devices, which correlates at typical office environments to a relative humidity accuracy of about ±0.5%. These devices need frequent cleaning, a skilled operator and periodic calibration to attain these levels of accuracy.

Fig. Electronic Hygrometer

Calibration Standards:

A) Gravimetric hygrometer

A Gravimetric Hygrometer measures the mass of an air sample compared to an equal volume of dry air. This is considered the most accurate primary method to determine the moisture content of the air. The inconvenience of using this device means it is usually only used to calibrate less accurate instruments, called transfer standards.

B) Chilled mirror hygrometer

A chilled mirror hygrometer measures the temperature of a mirror at the point when moisture (dew) begins to condense on it, thus giving a measurement of the dew point. These are a common transfer standard in laboratories and metrology labs.

C) Psychrometers

Accurate calibration of the thermometers used is fundamental to precise humidity determination by the wet-dry method. The thermometers must be protected from radiant heat and must have a sufficiently high flow of air over the wet bulb for the most accurate results this device, each thermometer is suspended within a vertical tube of polished metal, and that tube is in turn suspended within a second metal tube of slightly larger diameter; these double tubes serve to isolate the thermometers from radiant heating. Air is drawn through the tubes with a fan that is

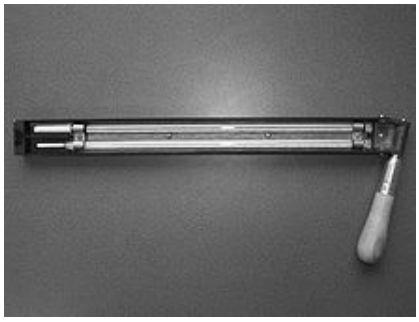

Fig. Outside Psychrometers

driven by a clockwork mechanism to ensure a consistent speed The principle of the heated psychrometer is that the water vapour content of an air mass does not change if it is heated.

By:

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COMPANY PROFILE:

Larsen & Toubro Limited is termed as L&T, is an Indian multinational conglomerate corporation headquartered in Mumbai, Maharashtra, India. The Company has business interests in engineering, construction, manufacturing, information technology and financial services.

L&T is India's largest engineering and construction company, with a dominant presence in India's infrastructure, power, hydrocarbon, machinery and railway related projects. In recent years, L&T has expanded its global presence and international projects contributed 9% of its overall order book for the 2010–11 period.

The company was founded in Mumbai in 1938 by two Danish engineers, Henning Holck-Larsen and Søren Kristian Toubro. The company began as a representative of Danish manufacturers of dairy equipment. However, with the start of the Second World War in 1939 and the resulting restriction on imports, the partners started a small workshop to undertake jobs and provide service facilities.

Germany's invasion of Denmark in 1940 stopped supplies of Danish products. The war-time need to repair and refit ships offered L&T an opportunity, and led to the formation of a new company, Hilda Ltd., to handle these operations. L&T also started two repair and fabrication shops signaling the expansion of the company. The sudden internment of German engineers in India (due to suspicions caused by the War), who were to put up a soda ash plant for the Tatas, gave L&T a chance to enter the field of installation. In 1944, ECC was incorporated by the partners; the company at this time was focused on construction projects (Presently, ECC is the construction division of L&T).

The design wing of L&T ECC is called EDRC (Engineering Design and Research Centre). EDRC provides consultancy, design and total engineering solutions to customers. It carries out basic and detailed design for both residential and commercial projects.

L&T has expanded its focus to the Middle East, South East Asia, Russia, CIS, Mauritius, African and SAARC countries. It also has keen interest in the markets of Indian Ocean rim countries, Africa and Latin America. For the first quarter of FY 2012-13, L & T Construction has bagged orders worth Rs 2410 cores

L&T is claimed to be among the top five fabrication companies in the world. The Heavy engineering division manufactures and supplies custom designed and engineered critical equipment and systems to the needs of core-sector industries and the defence sector. It is the preferred supplier of equipment for a select range of products, globally.

By:

Ms.S.A.Diana Mary,
Final Year(MEIEA).

CATALYTIC BEAD SENSOR(CBS):

A Catalytic Bead Sensor is a type of sensor that is used for gas detection. It consist of two coils of fine platinum wire each embedded in a bead of alumina, connected electrically in a Wheatstone bridge circuit.

One of the pellistors is impregnated with a special catalyst which promotes oxidation whilst the other is treated to inhibit oxidation. Current is passed through the coils so that they reach a temperature at which oxidation of a gas readily occurs at the catalysed bead (500-550°C).

Passing combustible gas raises the temperature further which increases the resistance of the platinum coil in the catalysed bead, leading to an imbalance of the bridge. This output change is linear, for most gases, up to and beyond 100% LEL, response time is a few seconds to detect alarm levels (around 20% LEL), at least 12% oxygen by volume is needed for the oxidation.

Catalyst poisoning refers to the effect that a catalyst can be 'poisoned' if it reacts with another compound that bonds chemically to its active surface sites. This effectively reduces the usefulness of the catalyst. Poisoned sites can no longer accelerate the reaction with which the catalyst was supposed to catalyze.

Large scale production of substances such as ammonia in the Haber-Bosch process include steps to remove potential poisons from the product stream. An example can be seen with Raney nickel catalyst, which have reduced activity when it is in combination with mild steel. The loss in activity of catalyst can be overcome by having a lining of epoxy or other substances.

Poisoning of palladium and platinum catalysts has been extensively researched. As a rule of thumb, platinum (as Adam's catalyst, finely divided on carbon) is less susceptible. Common poisons for these two metals are sulfur and nitrogen-heterocycles like pyridine and quinoline.

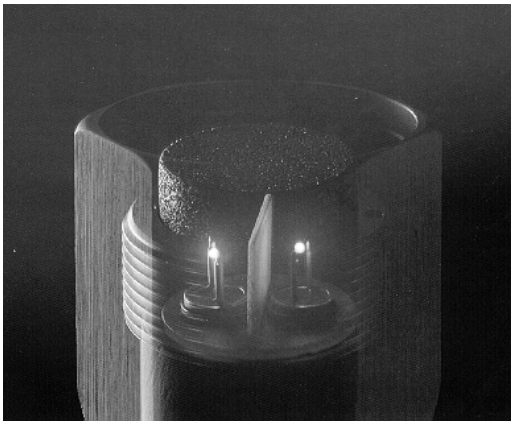

Fig.Catalytic Bead Sensor

A catalytic converter for an automobile can be poisoned if the vehicle is operated on gasoline containing lead additives. Fuel cells running on hydrogen must use very pure reactants, free of sulfur and carbon compounds.

Catalyst poisoning to enhance selectivity

Usually, catalyst poisoning is undesirable as it leads to a loss of usefulness of expensive noble metals or their complexes. However, poisoning of catalysts can be used to improve selectivities of reactions.

In the classical "Rosenmund reduction" of acyl chlorides to aldehydes, the palladium catalyst (over barium sulfate or calcium carbonate) is poisoned by the addition of sulfur or

quinoline. This system reduces triple bonds faster than double bonds allowing for an especially selective reduction. Lindlar's catalyst is another example — palladium poisoned with lead salts.

Delphian's Catalytic Bead Sensor:

Delphian's sensor is a catalytic bead sensor. This sensor is made from two separate elements (or beads). One element (the active element) is made by winding a small coil of wire, sealing it in a ceramic substance and then coating it with a catalyst.

The second element (the reference element) is made identical to the active element except in place of the catalyst, a passivating substance is used. The reference bead compensates for changes in ambient temperature, humidity and pressure variations.

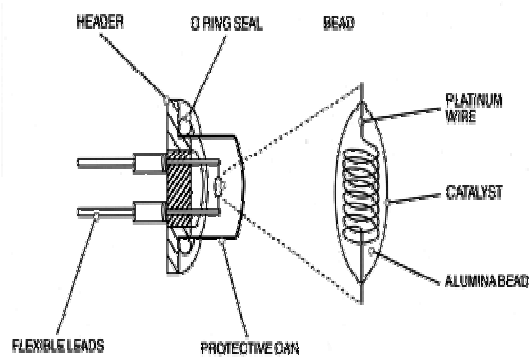

Fig.Schematic Diagram of CBS

Catalytic bead sensors operate above a threshold or "turn-on" voltage corresponding to the bead temperature which can, in the presence of the catalyst and oxygen, first ignite the gas. As the sensor ages, the catalyst slowly deactivates on the bead.

The threshold voltage gradually increases, and the sensor sensitivity decreases. At the same time, changes in the wire coil cause increased zero drift and noise. The result is the sensor must be replaced.

The mixture of combustible gas or vapor in air diffuses through the sensor flame arrestor, it oxidizes on the catalytically treated sensing bead.

Since this oxidation reaction is exothermic, it causes an increase in the temperature of this bead (in relationship to the temperature of the reference bead) and a resulting increase in the electrical resistance of a small platinum coil embedded in this bead.

The change in resistance in the embedded platinum coil is proportional to the amount of chemical energy released by the oxidation reaction.

Electronic circuitry (transmitter) immediately detects this increase in resistance and reduces electrical power to the bead until the original platinum coil resistance is restored. The amount of electrical power removed is linearly proportional to the combustible gas concentration present.

By:

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Lect\(EIE).

CLAP SWITCH:

This a clap switch free from false triggering. To turn on/off any appliance, just have to clap twice. The circuit changes its output state only when it clap twice within the set time period. It clap within 3 seconds. The clap sound sensed by condenser microphone is amplified by transistor T1. The amplified signal provides negative pulse to pin 2 of IC1 and IC2, triggering both the ICs. IC1, commonly used as a timer, is wired here as a monostable multivibrator.

second clap, a negative pulse triggers IC2 and its output pin 3 goes high for a time period depending on R9 and C5.

This provides a positive pulse at clock pin 14 of decade counter IC 4017 (IC3). Decade counter IC3 is wired here as a bistable. The output of IC1 provides supply voltage to IC2 at its pins 8 and 4.

Each pulse applied at clock pin 14 changes the output state at pin 2 (Q1) of IC3 because Q2 is connected to reset pin 15.

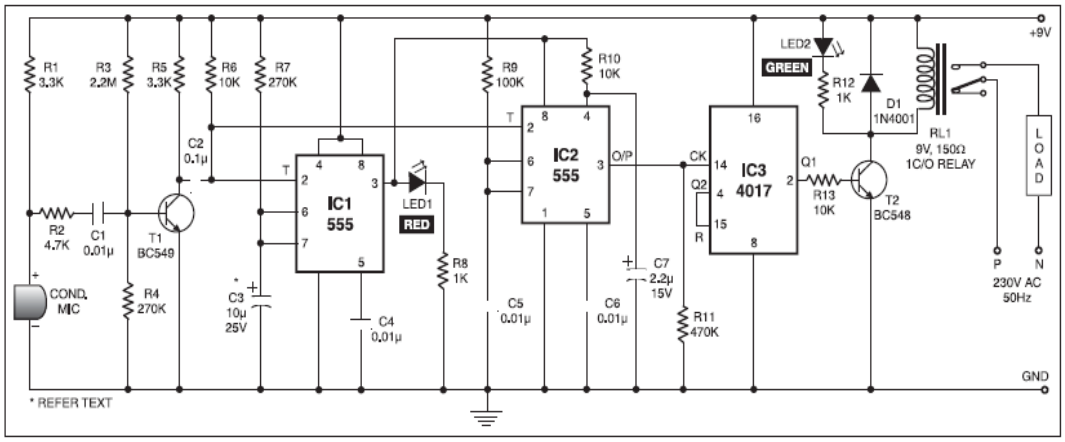

Fig. Circuit Diagram of Clap Switch.

Trigging of IC1 causes pin 3 to go high and it remains high for a certain time period depending on the selected values of R7 and C3. This 'on' time (T) of IC1 can be calculated using the following relationship: T=1.1R7 at C3 seconds.

Where R7 is in ohms and C3 in microfarads. On first clap, output pin 3 of IC1 goes high and remains in this standby position for the preset time. Also, LED1 glows for this period. Now IC2 is ready to receive the triggering signal.

Resistor R10 and capacitor C7 connected to pin 4 of IC2 prevent false triggering when IC1 provides the supply voltage to IC2 at first clap. On

The high output at pin 2 drives transistor T2 and also energises relay RL1.

LED2 indicates activation of relay RL1 and on/off status of the appliance. A free-wheeling diode (D1) prevents damage of T2 when relay de-energises.

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TECHS&APPS:

1)At what time after 4.00 p.m. is the minutes hand of a clock exactly aligned with the hour hand?

1. 4:21:49.5
2. 4:27:49.5
3. 3:21:49.5
4. 4:21:44.5

2) Dinesh travelled 1200 km by air which formed 2/5 of his trip. One third of the whole trip, he travelled by car and the rest of the journey he performed by train. What was the distance travelled by train?

1. 600Km
2. 700Km
3. 800Km
4. 900Km

3) Pipe A can fill in 20 minutes and Pipe B in 30 mins and Pipe C can empty the same in 40 mins.If all of them work together, find the time taken to fill the tank

1. 17 1/7 mins
2. 20 mins
3. 8 mins
4. none of these

4) A person has 4 coins each of different denomination. What is the number of different sums of money the person can form (using one or more coins at a time)?

1. 16
2. 15
3. 12
4. 11

5) A cow is tethered in the middle of a field with a 14 feet long rope. If the cow grazes 100 sq. ft. per day, then approximately what time will be taken by the cow to graze the whole field ?

1. 2 days
2. 6 days
3. 18 days
4. 24 days
5. None of these

6) 2 hours after a freight train leaves Delhi a passenger train leaves the same station travelling in the same direction at an average speed of 16 km/hr. After travelling 4 hrs the passenger train overtakes the freight train. The average speed of the freight train was?

1. 40
2. 30
3. 80
4. 60

7) The two colors seen at the extreme ends of the pH chart are:

1. Red and Blue
2. Red and Green
3. Green and Blue
4. Orange and Green

8) One of Mr. Horton, his wife, their son, and Mr. Horton's mother is a doctor and another is a lawyer.
a) If the doctor is younger than the lawyer, then the doctor and the lawyer are not blood relatives.
b) If the doctor is a woman, then the doctor and the lawyer are blood relatives.
c) If the lawyer is a man, then the doctor is a man. Whose occupation you know?

1. Mr. Horton: he is the doctor
2. Mr. Horton's son: she is the lawyer
3. Mr. Horton: he is the doctor
4. Mr. Horton's mother: she is the doctor

9) Which number is the odd one out?
9678 4572 5261 3527 7768

1. 7768
2. 3527
3. 4572
4. 9678
5. 5261

10) If x=y=2z and xyz=256 then what is the value of x?

1. 8
2. 3
3. 5
4. 6

11) If the value of x lies between 0 & 1 which of the following is the largest?

1. x
2. x2
3. -x
4. 1/x

12) The tutor of Alexander the great was

1. Darius
2. Cyrus
3. Socrates
4. Aristotle

13) x% of y is y% of ?

1. x/y
2. 2y
3. x
4. can't be determined

14) The mass number of a nucleus is The mass number of a nucleus is

1. Always less than its atomic number
2. Always more than its atomic number
3. Sometimes more than and sometimes equal to its atomic number
4. None of the above

15) Thirty men take 20 days to complete a job working 9 hours a day. How many hour a day should 40 men work to complete the job?

1. 8 hrs
2. 71/2 hrs
3. 7 hrs
4. 9 hrs

16) A and B can do a piece of work in 45 days and 40 days respectively. They began to do the work together but A leaves after some days and then B completed the remaining work n 23 days. The number of days after which A left the work was

1. 9
2. 11
3. 12
4. 15
5. 16

17) Sam and Mala have a conversation. Sam says I am certainly not over 40 Mala Says I am 38 and you are at least 5 years older than me · Now Sam says you are at least 39 all the statements by the two are false. How old are they really?

1. Mala = 38 yrs, Sam =31 yrs.
2. Mala = 38 yrs, Sam = 41 yrs
3. Mala = 31 yrs, Sam = 41 yrs.
4. Mala = 45yrs, Sam = 41 yrs

18) In a single throw of a dice, what is the probability of getting a number greater than 4?

1. 1/2
2. 2/3
3. 1/4
4. 1/3

By:

Mr.P.Samuel,
Final Year(MEIEA).

TOGETHER

EVERYONE

ACHIEVES

MORE