Electronics 101: Components of a Communication System

A general communication system consists of information source, transmitter, channel, receiver and destination. Information or intelligence is basically a physical quantity such as mass or length. Thus when we speak of one kilo gram of a given object it is immaterial what the material is concerned whether it is gold or brass or silicon. Information theory is a scientific study of information and the communication systems design to handle it. These communication systems include telegraphy, radio communication, computers etc. the information theory establish precisely and mathematically the rate of information being issued from a source, the information capacity of any channel. System or storage device and efficiency of codes used for sending information. For a specific application the type of code used depends upon the form and type of information and also on the noise prevailing on the communication system. Information is defined as the choice of one message out of a finite set of messages. Meaning of the message is immaterial. Thus it is quite possible that a cheap fiction book may contain more information than a high quality text book. If the fiction book contains a larger number of choices from a set of possible messages, the set being the complete English language in this case.

Further, while measuring information we must consider that some choices are more likely than others and therefore contain less information. A choice with probability of one carries zero information. Consider the choice involving two equally likely events that is two events with equal probability. Then the probability of each event is exactly half. Thus when we toss a coin the probability of head and tail is half each. The information content of this kind of choice is taken as the basic unit of information and is referred to as the binary digit or bit. Thus bit is defined as the quantity of information required to permit the correct selection of one out of a pair of equally probable events. In a telegraph system for transmission of words some form of coding should be used. Thus a different pulse may be of different width or amplitude may be used for each letter and symbol. English language has twenty six letters and roughly the same number of other symbols. Thus we need about sixty different pulses. Such a system may no doubt be used but is never used in practice because of excessive distortion by noise. Almost all practical system use binary systems using two conditions that are mark condition using full amplitude pulse and space condition using no pulse. In such a system noise has to compete with the full power of the transmitter. Accordingly an extremely large noise pulse alone can convert a mark into a space or vice versa.

About the Author

Tymon Hytem has worked in the electronics feild for the past 15 years. He enjoys helping people decide on electronic gadgets from telephones to XM Radio and choosing the perfect XM Satellite Radio system for their needs.

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