Analog communication

Use of analog in every day life

Abstract:

As the topic of my term paper is Analog Communication in everyday life. As analog communication is a data transmitting technique in a format that utilizes continuous signals to transmit data including voice, image, video, electrons etc. An analog signal is a variable signal continuous in both time and amplitude which is generally carried by use of modulation. Along with the working in analog communication it is used in various techniques which has been mentioned.

I. INTRODUCTION:

A communication system is made up of devices that employ one of two communication methods (wireless or wired), different types of equipment (portable radios, mobile radios, base/fixed station radios, and repeaters), and various accessories (examples include speaker microphones, battery eliminators, and carrying cases) and/or enhancements (encryption, digital communications, security measures, and interoperability/networking) to meet the user needs.

A communication system can be considered to be “ wired” or “ wireless” (e. g., conventional telephone, radio communications, etc.). A wired system is technically known as a hard-line system and can be thought of as a localized, private telephone system that uses wires to operate over a limited area. A wireless system uses radio frequencies to “ connect” users and is capable of operating over a much larger geographical area than a hard-line (wired) system.

A. Hard-Line Technology:

Hard-line communication systems operate by transmitting voice and data through a cable thatconnects to a telephone-like apparatus. The major advantage of a hard-line system is the abilityto communicate from underground, confined spaces, shielded enclosures, collapsed structurevoid spaces, and similar locations (such as explosive environments) where RF systems areunreliable or unable to be used.

Since the communication equipment available to emergency first responders today does not use optical transmission

methods, only radio frequency (RF) equipment will be considered here. Shared communication systems such as radios, the Internet, and telephone conference calls are subject to saturation by users (the maximum capacity whereby adding users will deteriorate and degrade the amount and quality of information able to be transferred over the system), a problem that compounds exponentially as the number of users increases. Communication system efficiency requires that the users follow published communication system guidelines regarding proper system discipline in order to ensure maximum efficiency of communication traffic.

A radio apparatus has a section for receiving an analog signal and a digital angle-modulated carrier wave signal. The analog signal and digital angle-modulated carrier wave output of the receiver section are demodulated to provide first and second demodulated signals. A clock signal is regenerated from the output of either the demodulating means or receiver section. A control signal selectively operates a switch for passing either the first or the

second demodulated signals. The regenerated clock signal controls the switch.

The radio equipment involved in communication systems includes a transmitter and a receiver, each having an antenna and appropriate terminal equipment such as a microphone at the transmitter and a loudspeaker at the recieiver in the case of a voice-communication system.

A transmitter is an electronic device which, usually with the aid of an antenna, propagates an electromagnetic signal such as radio, television, or other telecommunications.

The analog communication system uses a modified version of the high sensitivity homodyne Syncbit data transmission principle and uses the proven Nd: YAG laser technology operating at 1064 nm. Therefore, it can use the same electro- optical building blocks (lasers, modulator, laser amplifier) as the digital system.

The analog communication system fits into the modular concept of the OPTEL terminals and is fully compatible to all optical heads of the terminal family.

II. USE IN EVERY DAY LIFE:

B. Portable Radios:

Portable radios are small, lightweight, handheld, wireless communication units that contain both a transmitter and a receiver, a self-contained microphone and speaker, an attached power supply (typically a rechargeable battery), and antenna. Portable transceivers (such as a walkie-talkie) have relatively low-powered transmitters (1 W to 5 W), need to have their

batteries periodically recharged or replaced, and may be combined in a wireless radio communication system with other portable, mobile, and base station radios. There are also very low-powered transceivers, available with power outputs of 0. 1 W, which are generally linked to portable repeaters for extended range and interoperability with higher-powered radio systems.

C. Mobile Radios:

Mobile radios are larger than portable radios and are designed to be mounted in a fixed location inside a vehicle (police cruiser, fire truck, etc.). Like the portable radios, mobile radios contain both a transmitter and a receiver and may contain an internal speaker. However, mobile radios connect to the vehicle’s power supply, which enables them to have a higher transmitter output power (typically 5 W to 50 W) and an external antenna. The microphone is usually handheld, and the speaker may be externally located to the radio. Because of the higher transmitter power and external antenna, the effective communication range is greater than that of a portable radio, especially if a repeater is not used.

D. Repeaters:

A repeater is a specialized radio that contains both a receiver and a transmitter. Repeaters are used to increase the effective communications coverage area for portable, mobile, or base station radios that otherwise might not be able to communicate with one another. The repeater’s receiver is tuned to the frequency used by a portable, mobile, or base station transmitter for incoming signals, and the repeater’s transmitter is tuned to the frequency used by a portable, mobile, or base station receiver.

E. In lab practicals:

Our study contains both computer-simulated applications and real time applications. The front panels of the real time applications have been presented here. The front panels of real time applications of AM, PCM, ASK, FSK and PSK which are designed by using LabVIEW program are shown below.

Such a system provides ahigh speech quality. Well known among these digital angle modulation systems are phase shift keying (PSK) and frequency shift keying (FSK) systems. The PSK modulation system is an excellent system for the transmission of a large quantity of information per unit of frequency band and for requiring no large signal-to-noise power ratio in order to reduce the error rate to a given level. The FSK modulation system can cause class C amplifiers, or the like, to act nonlinearly because such an amplifier has a constant amplitude component. It is also superior in power efficiency and can be effectively used for apparatus with small battery capacities, such as mobile communication units.

The front panels called “ user interfaces” are designed as authentically as possible. The front panels of these applications that contain two sections such as the control buttons on the left and input-output waveforms of the experiments on the right are designed in a simple and intelligible structure.

The frequency of sample impulses (PCM), carrier frequencies (ASK, FSK, PSK, AM) are changed as virtual and the frequency of message signals are changed as real time by using control buttons. So students can change the message signals in real time via voltage controlled circuit (VCO) by

controlling the connected devices. The measured results from the instruments are brought to the user through the same interface.

There are five types of signals such as sinusoidal, square, triangle, saw tooth and random on the message signal part. In addition, the front panels display message signal, sample impulses, carrier signals as input and AM modulated signal,

PCM code sequence, ASK, FSK, PSK signals as output.

III. INTEROPERABILITY AND NETWORKING:

Interoperability is the process of connecting different groups using different radio systems and communication technologies (telephones, radios, cellular communications, and satellite Communications) so that they can communicate directly with one another without having to go through multiple dispatchers or relay personnel. In the context of communications, interoperability describes the situation where different communication systems that are otherwise incompatible with one another work together without relying on the addition of considerably more manpower.

Analog communication system block diagram

Signal path block diagram for an analog crosslink transceiver showing the building blocks of:

– analog communication system (green)

– laser subsystem (magenta)

– general communication functions, common to analog and to digital comms system (blue)

The also shows for information the building blocks of a digital communication system as outlined boxes and the 3 switches to select either analog or digital operation.

IV. ANALOG IN HARDWARE SYSTEM:

The hardware system and its components of the real time Analog and Digital Communication experiments . In this structure, Laboratory PC which includes GPIB and Ethernet Interfaces is called as a server PC. It works as the main controller. By using Voltage Controlled Oscillator (VCO) a message signal has been obtained for experiments. The input signal of VCO is controlled by the DC power supply with GPIB and the output signal of VCO circuit is measured with digital multimeter and then sent back to the Laboratory PC through the GPIB. This measured signal is applied to the system as a message frequency.

V. ANALOG COMMUNICATION IN ANTENNA:

In the design of the analog communication system a precondition was to use the same electro-optic building blocks in the analog as in the digital terminals. The analog communication system module is another extension of our modular product family and fits together with all other modules of our terminals.

F. Crosslink concept:

In an analog satellite user data is contained in individual channels. Each channel has a certain bandwidth, for instance 36 MHz, and certain distance from the neighboring channels. In most cases channels are lined up in an equidistant frequency raster, the channel spacing, for instance, 41 MHz. The analog crosslink terminal accepts all channels from the uplink to satellite “

A” which have to be transmitted to the counter terminal on satellite “ B” and modulates them onto the optical carrier.

The laserbeam is transmitted through the free-space channel to satellite “ B”. The optical counter terminal on satellite “ B” receives the optical carrier, extracts the channels and inserts them into the microwave communications payload of satellite “ B”. Satellite “ B” can now distribute the information in the usual way.

Crosslink concept with baseline crosslink

* channel rearrangement

* parallel distribution by on board information duplication

For different overall signal to noise ratio or bit error rate requirements the ISL SNR can be easily increased or relaxed by varying the optical output power of the terminal transmitter

Signal path and SNR definitions for uplink (SNRup), downlink (SNRdown) and ISL crosslink (SNRISL).

VI. ANALOG COMMUNICATION IN SPEECH COMMUNICATION

Although speakers can use analog variation of acoustic properties to express the same information conveyed by lexical items in a sentence, can analog expression convey information that is independent of the propositional content or does it function just to modulate propositional meaning? If analog acoustic expression is a channel of communication that is truly different from the linguisticpropositional channel, speakers should be able to express information that is different from the information conveyed in words and

sentences. Experiment 2 tested whether speakers can indeed use this channel to express information that is independent of the propositional content of the utterance and, importantly, to see whether listeners are sensitive to the message conveyed exclusively through analog acoustic expression. If analog acoustic expression serves a communicative function, listeners should be able to understand the information it conveys, even when this information is not conveyed by any of the lexical items used by speakers.

Analog acoustic expression serves a communicative function by providing listeners with a ‘‘ channel” of information over and above the propositional-linguistic content of the utterance. Furthermore, analog acoustic expression may facilitate comprehension by setting up a non-arbitrary mapping between form and meaning adding to the information provided by the arbitrary form-meaning mapping in the linguistic channel. Although in some cases analog acoustic expression may result from the speaker’s communicative intention to convey a specific message through acoustic variation (the baseball example given earlier may be such an example), the results here are consistent with the idea that analog acoustic expression does not require a specific communicative intention on the part of the speaker.

CONCLUSION

In this term paper I have explained the use of analog communication in daily life which includes in antenna for television broad casting, radios, speech communication, mobile radios, and also in satellites which has been required daily. Thus we have used analog communications even for our practical

purposes. For this issue of using analog communication I have explained the further requirements of the analog communication in the upcoming years.

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