Aglow College of Science & Technology

Sheikhupura.

Equipment Maintenance & Servicing ELTR-303

NOTES

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Colour TV Receiver

Basic Concepts of Colour TV Receiver

A TV receiver is a set-top box that permits the reception of digital television. Its components are very similar to a desktop PC. The TV receiver is a vital link in the chain of television system. ... outputs digital surround sound; processes and renders Internet and interactive TV services.

How a cathode-ray tube (CRT) TV works. An antenna (aerial) on your roof picks up radio waves from the transmitter. ... The incoming signal feeds into the antenna socket on the back of the TV. The incoming signal is carrying picture and sound for more than one station (program)

Block Diagram of Colour TV Receiver
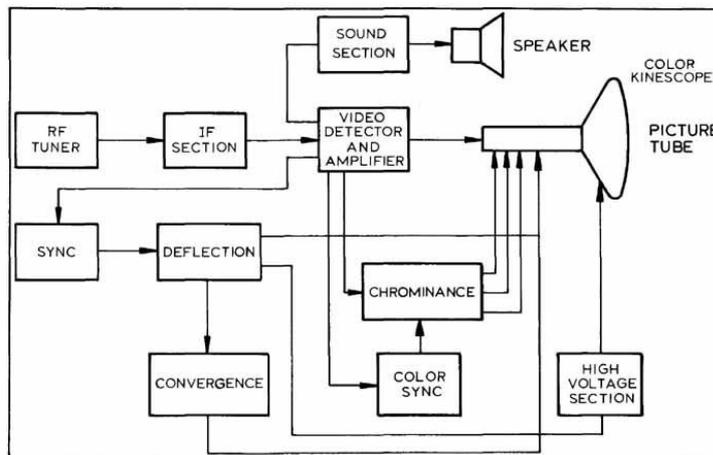
Luminance Channel

There are instruments which measure brightness or more correctly luminance. The term luminance is defined by the CIE. ... The luminance channel is also referred to as the achromatic channel or the spectrally non-opponent channel.

Chroma Decoder

The Chroma decoder is a device inside the Television that "decodes" the composite video signal into the RGB (Red, Green and Blue) signal to drive the CRT('s). This decoding process starts with the comb filter by separating the Luma and Chroma signals.

Colour Picture Tubes

The cathode ray tube (CRT) is a vacuum tube that contains one or more electron guns and a phosphorescent screen, and is used to display images. It modulates, accelerates, and deflects electron beam(s) onto the screen to create the images

Trintron Colour Picture Tube

Trinitron is Sony's brand name for its line of aperture-grille-based CRTs used in television sets and computer displays. ... Sony responded by introducing their flat-screen FD Trinitron designs (WEGA), which maintained their premier position in the market into the early 2000s.

Satellite TV Receivers

The signals are received via an outdoor parabolic antenna usually referred to as a satellite dish and a low-noise block down converter (LNB). A satellite receiver then decodes the desired television program for viewing on a television set.

Camera Tubes

The video camera tube was a type of <u>cathode ray tube</u> used to capture the <u>television</u> image prior to the introduction of <u>charge-coupled devices</u> (CCDs) in the 1970s. Several different types of tubes were in use from the early 1930s to the 1980s.

In these tubes, the <u>cathode ray</u> was scanned across an image of the scene to be broadcast. The resultant current was dependent on the brightness of the image on the target. The size of the striking ray was tiny compared to the size of the target, allowing 483 horizontal <u>scan lines</u> per image in the <u>NTSC</u> format, or 576 lines in <u>PAL</u>.

Principles of Optical-electrical Conversion

Requirements

1. Receive input signal from tunable lasers and meet required bandwidth to properly convert signal to voltages.
2. Detect when zero crossings occur from two input signals.
3. Send clock signal to optical receiver of OCT that correlates to zero crossings.
4. Hold the present state when data not valid signal is low and once data not valid signal goes high continue from the same state

Design

Optical to Electrical Converter Block Diagram
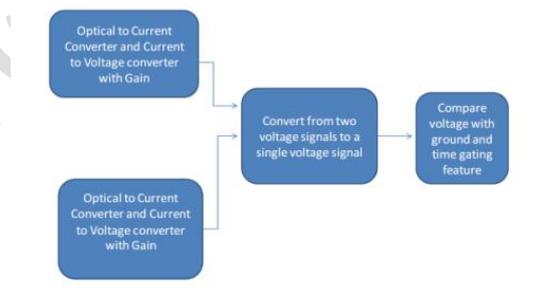
Vidicon Camera Tube

The vidicon is a storage-type camera tube in which a charge-density pattern is formed by the imaged scene radiation on a photoconductive surface which is then scanned by a beam of low-velocity electrons. The fluctuating voltage coupled out to a video amplifier can be used to reproduce the scene being imaged.

Plumbicon Camera Tube

Vidicon. A vidicon tube is a video camera tube design in which the target material is a photoconductor. The Vidicon was developed in the 1950s at RCA by P. K. ... Forgue and R. R. Goodrich as a simple alternative to the structurally and electrically complex Image Orthicon.

Solid State Camera Tube

A solid state camera tube is provided with an optical filter which acts as a fixed iris. A solid state photo conducting target activated by the infrared light is provided in the camera tube. A light source comprising an array of infrared light emitting diodes is employed with the camera tube to illuminate the image. The camera tube and the light source is combined to provide apparatus for surveillance, or in combination with a display, for suitable use in an audio-video telephone system.

Video Disk System

Video Display Unit

A video display unit (VDU) consists of: A computer output device that uses a cathode ray tube or other technology to present visual images. One or more input devices, such as a keyboard , a mouse , or both.

Video Monitor

A video monitor also called a broadcast monitor, broadcast video monitor, broadcast reference monitor or just reference monitor, is a display device similar to a television set, used to monitor the output of a video-generating device, such as play out from a video server, IRD, video camera, VCR, or DVD player.

LCD Displays

LCD (liquid crystal display) is the technology used for displays in notebook and other smaller computers. Like light-emitting diode (LED) and gas-plasma technologies, LCD sallow displays to be much thinner than cathode ray tube (CRT) technology.

Plasma Displays

A plasma display is a computer video display in which each pixel on the screen is illuminated by a tiny bit of plasma or charged gas, somewhat like a tiny neon light. Plasma displays are thinner than cathode ray tube (CRT) displays and brighter than liquid crystal displays (LCD).

Large Screen

Large-screen television technology developed rapidly in the late 1990s and 2000s. Various thin screen technologies are being developed, but only the liquid crystal display (LCD), plasma display (PDP) and Digital Light Processing (DLP) have been released on the public market.

Close Circuit TV

CCTV (closed-circuit television) is a TV system in which signals are not publicly distributed but are monitored, primarily for surveillance and security purposes. CCTVrelies on strategic placement of cameras and private observation of the camera's input on monitors.

## Basic Concepts of High Definition Television

HDTV is a digital TV broadcasting format where the broadcast transmits widescreen pictures with more detail and quality than found in a standard analog television, or other digital television formats. HDTV is a type of Digital Television (DTV) broadcast, and is considered to be the best quality DTV format available.

Microwave Oven

Operating Principal Microwave Oven

A microwave oven uses microwaves to heat food. Microwaves are radio waves. In the case of microwave ovens, the commonly used radio wave frequency is roughly 2,500 megahertz (2.5 gigahertz). Radio waves in this frequency range have an interesting property : they are absorbed by water, fats and sugars. When they are absorbed they are converted directly into atomic motion and motion is converted into heat.

Block Diagram of Microwave Oven
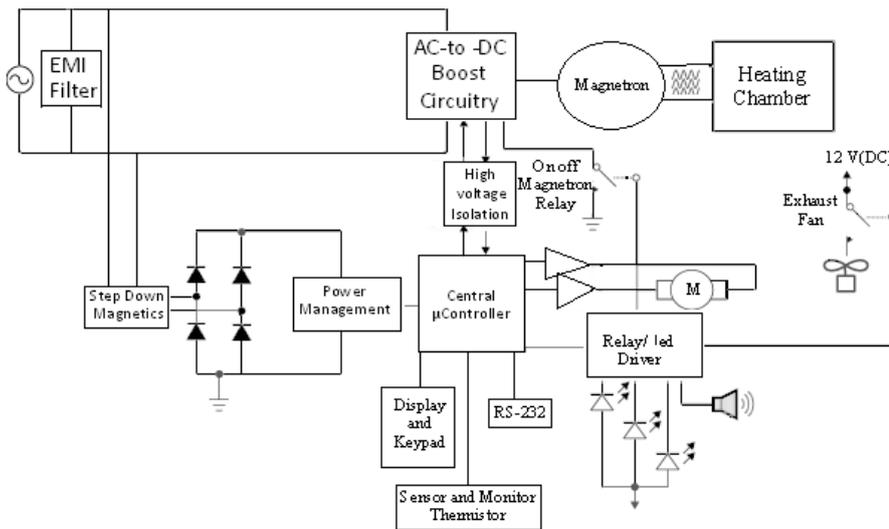


Features of Microwave Oven
- Decide how fast you want your food to cook
- Specialized cooking buttons
- Defrosting
- Heating Process
- Make food hot without destroying it.

Remote Control

Operating Principal of Remote Control
A transmitter is often a light emitting diode (LED) which is built into the pointing end of the remote control handset. The infrared light pulses form a pattern unique to that button. The receiver in the device recognizes the pattern and causes the device to respond accordingly.

Block Diagram of Remote Control
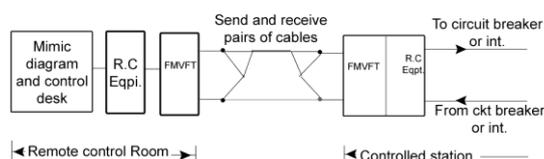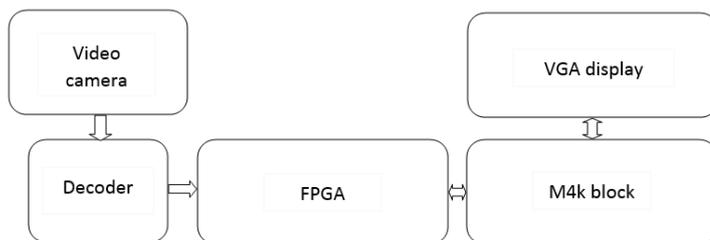
Video Games

Operating Principal of Video games

The basic pieces really haven't changed that much since the birth of the Atari 2600. Here's a list of the core components that all video game systems have in common:

- User control interface
- CPU
- RAM
- Software kernel
- Storage medium for games
- Video output
- Audio output
- Power supply

The user control interface allows the player to interact with the video game. Without it, a video game would be a passive medium, like [cable TV](). Early game systems used paddles or joysticks, but most systems today use sophisticated controllers with a variety of buttons and special features.

Block Diagram of Video games

Features of Video games

- Video games should be very much interactive.
- Easy to use.
- Must contain help
- Keep user's interest
- There should be a suspense.
- It should be adventures.

Facsimile of Fax

Analog verse Digital Communication

Analog Communication. A communication format in which information is transmitted by modulating a continuous signal, such as a sound wave. Current TV and radio signals are analog, as are many telephone lines. See also Digital Communication.

Digital transmission is the transmission of digital pulses between two or more points in a communication system. • Digital radio is the transmitted of digital modulated analog carriers between two or more points in a communication system

Operating Principal Fax Machine

he original document is scanned with a fax machine (or a telecopier), which processes the contents (text or images) as a single fixed graphic image, converting it into a bitmap, and then transmitting it through the telephone system in the form of audio-frequency tones.

Features of Fax Machine

- It should contain good printing speed
- Printing quality should be fine.
- Paper feed option should be easy
- Paper cutter option should be available
- Dialing option should be present.
- History should be exist.

Cellular Phone

The Cell Approach

A cellular phone is a telecommunication device that uses radio waves over a networked area (cells) and is served through a cell site or base station at a fixed location, enabling calls to transmit wirelessly over a wide range, to a fixed landline or via the Internet.

Operating Principal of Cellular phones

In the most basic form, a cell phone is essentially a two-way radio, consisting of a radio transmitter and a radio receiver. When you chat with your friend on your cell phone, your phone converts your voice into an electrical signal, which is then transmitted via radio waves to the nearest cell tower

Functions perform by Cellular Phones

A battery, providing the power source for the phone functions. An input mechanism to allow the user to interact with the phone. The most common input mechanism is a keypad, but touch screens are also found in smartphones. Basic mobile phone services to allow users to make calls and send text messages.

Features of Cellular Phones

Other features that may be found on mobile phones include

1. GPS Navigation,
2. Music (MP3) And
3. Video (MP4) Playback,
4. RDS Radio Receiver,
5. Built-In Projector,
6. Vibration And Other "Silent" Ring Options,
7. Alarms,
8. Memo
9. Recording,
10. Personal Digital Assistant Functions,
11. Ability To Watch Streaming Video,
12. Video Download,
13. Video Calling
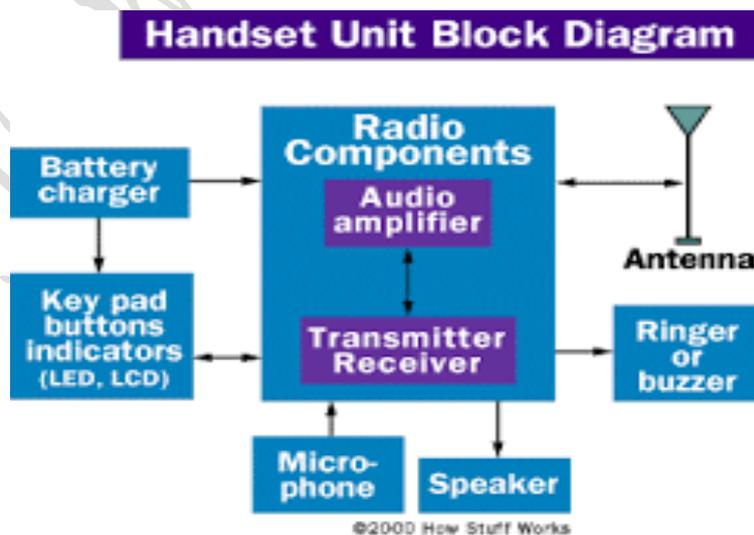
Wireless Phone or Cordless Phone

Operating Principal Of Wireless Phones.

As you chat away, your phone converts your voice into an electrical signal, which is then transmitted as radio waves and converted back into sound by your friend's phone. A basic mobile phone is therefore little more than a combined radio transmitter and a radio receiver, quite similar to a walkie-talkie or CB radio.

Block Diagram Of Base Unit
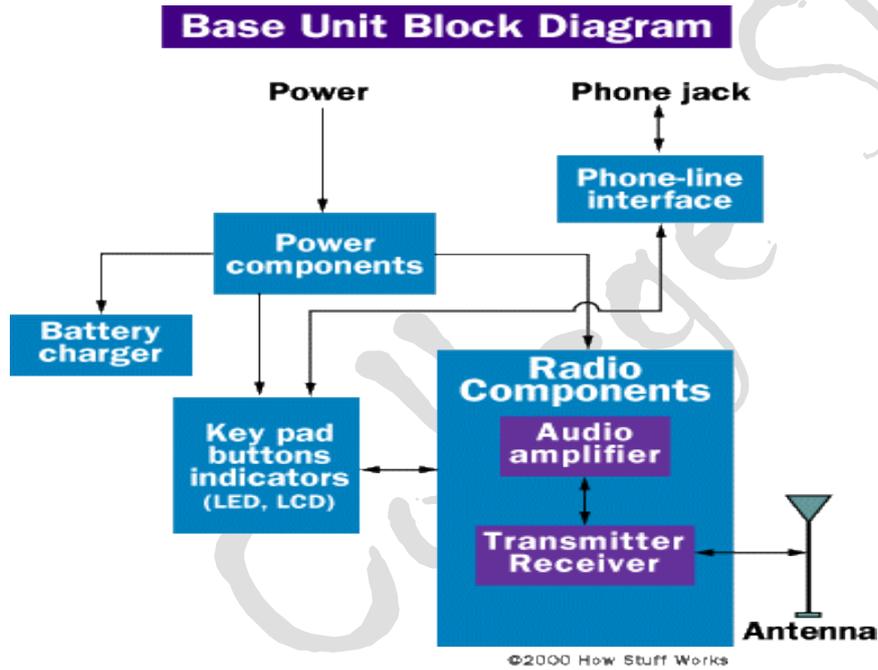
## Block Diagram Of Hand Set Unit

Features of Wireless Phone

Beyond these basic features, there are other features to look for when buying a cordless phone.
1. Speakerphone. ...
2. Base Keypad. ...
3. Multiple Handsets. ...
4. LCD Screen. ...
5. Mailboxes. ...
6. Two-Line Support. ...
7. Headset Jack. ...
8. Auto-Talk.
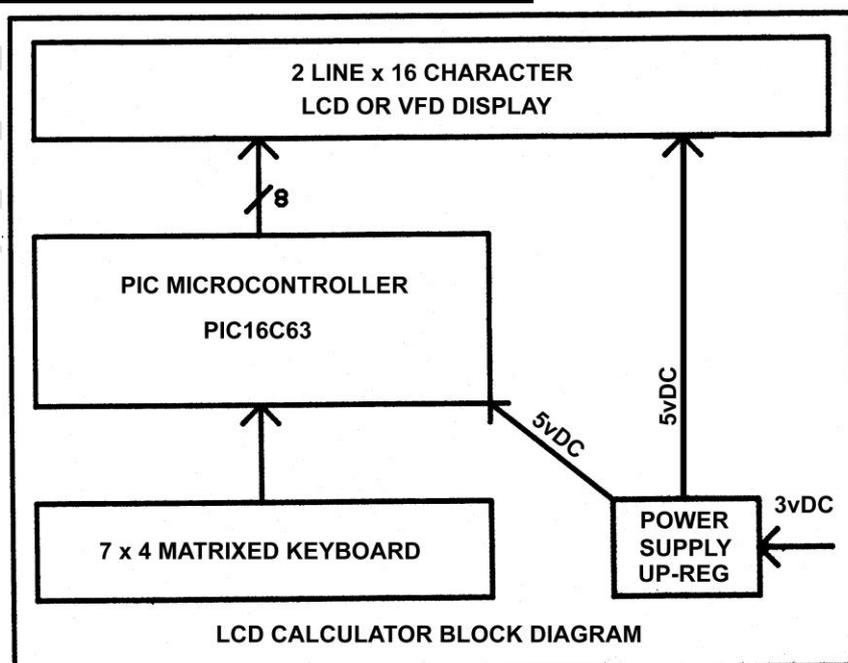
Digital Calculators & Diaries

Operating Principle of Digital Calculators and Diaries.

The binary number system is a base-two system, which means there are only two digits to work with: 0 and 1. Thus, when you input numbers into a calculator, the integrated circuit converts those numbers to binary strings of 0s and 1s.
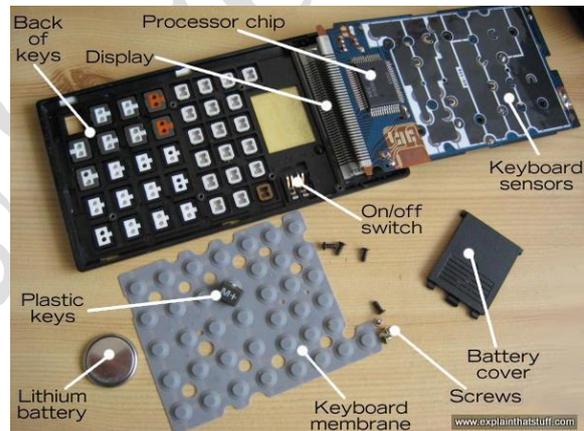
Block Diagram of Digital Calculators and Diaries.

Features of Digital Calculators and Diaries.

Modern calculators and digital diaries have following main features:

1. Fractions
2. Functions
3. Summation
4. Tracing a Curve to Find Coordinates
5. Sliders
6. Change Color or Style
7. Lists
8. Storage
9. Undo and Redo
10. Square Roots (Radical Symbol)
11. Change Language
12. Perform different scientific calculations.